UNIT 1

Lesson One

Matter and its Characteristics

Worksheet 1

1. Complete the following :

1. We can distinguish between ammonia and perfume by their different ....
2. .... and .... can float on water surface, while .... and .... can sink in water.
3. Density is .... of unit volume of the substance and its measuring unit is .... *(El-Agamy / Alex. 2022)*
4. .... is the measuring unit of mass, while .... is the measuring unit of volume. *(St. Joseph Sch. / Cairo 2020)*
5. .... , ... and .... are from the physical properties of matter.

2. Choose the correct answer :

1. The volume of the liquid is calculated from the relation ....

   a. $\frac{\text{mass}}{\text{density}}$ b. $\frac{\text{density}}{\text{mass}}$ c. mass × density. d. mass + density.

2. If you know that the density of water is 1 gm/cm^3, so the volume of 10 gm of water is ....

   a. 5 cm^3. b. 10 cm^3. c. 20 cm^3. d. 40 cm^3.

3. The taste property is the distinguishing factor between ....

   a. milk and honey. b. wood and plastic.
   c. silver and gold. d. oxygen and nitrogen.

4. The density of helium is .... that of air.

   a. less than b. more than c. equal to d. double

5. If the following shapes have the same mass. Which of them has the smallest density ? Fig. ....



a. b. c. d.

3. Give reasons for :

1. Equal volumes of different substances have different masses.

....

(Egypt Dream Sch. / Giza 2020)

2. An iron nail sinks in water, while one kilogram of cork floats on water surface. *(North Giza / Giza 2022)*

....

....

3. Water isn't used to put out petrol fires. *(Talae almustakbal Sch. / Giza 2023)*

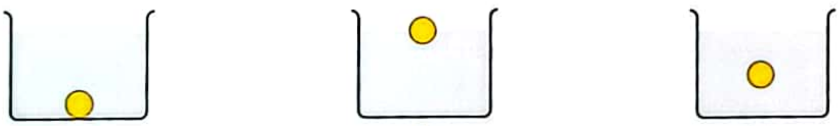
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....

4. A. Complete the following table : *(East Zone / Alex. 2020)*

Substance	Mass (gm)	Volume (cm^3)	Density (gm/cm^3)
(A)	22	.........(1).........	2
(B)	5	20	.........(2).........
(C)	.........(3).........	15	1

B. The following figures represent three balls of the same volume and mass. They are put in three beakers containing different liquids :



(a) (b) (c)

1. If the balls have the same volume and mass, while the liquids have the different densities. Arrange the liquids in an ascending order according to their densities.

....

2. If the balls are made of different materials and they are all placed in the same liquid. Arrange the balls in an ascending order according to their densities.

....

5. Problems :

1. When a piece of iron of mass 78 gm is put in a graduated cylinder containing 100 cm^3 of water, the reading of the cylinder becomes 110 cm^3. *(Menofia 2023)*

   Calculate the density of the piece of iron.

....

....

2. When five similar copper pieces are put in a graduated jar containing 60 cm^3 of water, the level of water reaches 75 cm^3. If the density of copper is 8.8 gm/cm^3.

   Find the mass of each piece.

....

....

....

3. In an experiment to determine the density of a liquid, the following results are recorded :
   - The mass of an empty cylinder = 56 gm.
   - The mass of the cylinder containing liquid = 156 gm. *(El-Agami Zone / Alex. 2020)*
   - The volume of the liquid = 100 cm^3.

   Calculate the density of the liquid.

   ....

   ....

4. If the mass of an empty graduated cylinder is 20 gm, its mass when it is filled completely with water is 30 gm and its mass when it is filled completely with unknown liquid is 27 gm. **Calculate the density of this unknown liquid.** (Density of water is 1 gm/cm^3).

   ....

   ....

Worksheet 2

1. What is meant by ... ?

1. Melting point : ....

   .... *(East Zone / Alex. 2020)*

2. Boiling point : ....

   ....

2. Complete the following :

1. .... and .... are from the substances which have low melting points, while .... and .... are from the substances which have high melting points.
2. Separation of petroleum components depends on the difference in their ....
3. .... is one of the solid substances which appears soft at room temperature, while .... is a solid substance which doesn't soften by heating.
4. An alloy of .... is used in making jewels, while an alloy of .... is used in making heating coils. *(Taymour Sch. / Alex. 2023)*

3. Give reasons for :

1. Cooking pans are made up of aluminium or stainless steel. *(Orman College Sch. / Giza 2020)*

   ....

2. A piece of ice melts when it is left in air.

   ....

3. Iron rods are used in building concrete houses, but copper rods are not used.

   ....

   (St. Joseph Sch. / Cairo 2022 / Manaret Heliopolis Sch. / Cairo 2020)

4. What is meant by ... ?

1. The melting point of ice = 0°C : ....
....
2. The boiling point of water = 100°C : ....
....

(St. Joseph Sch. / Cairo 2022)

Worksheet 3

1. Mention an example for :

1. A substance has low melting point. *(Menofia 2020)* (.........................)
2. A very active metal. *(Giza 2023)* (.........................)
3. A substance used to plate iron. *(El-Sayda Zainab Zone / Cairo 2023)* (.........................)
4. An inactive metal. (.........................)

2. Study the following figures, then answer the following question :

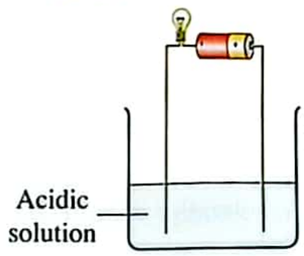


Fig. (1)

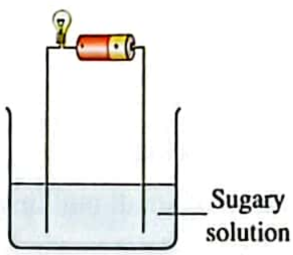


Fig. (2)

In which figure does the lamp illuminate ? Why ?

....

3. Complete the following sentences :

1. .... , ... and gold are .... metals , so they are used in making jewels.
2. .... and .... solutions are good conductors of electricity, while .... and .... solutions are bad conductors of electricity.

(El-Manahel Private Sch. / Sohag 2022, Qus official Sch. / Qena 2020)

3. Electric wires are made up of .... or .... as they are .... conductors of electricity. *(Port Said 2020)*
4. Light posts in streets are painted from time to time in order to protect them from ....

(Port Said 2020)

4. Give reasons for :

1. An electrician uses a screwdriver made up of a steel iron with a plastic handle.
....
....

(Al-Manar Sch. / Ismailia 2020)

2. Aluminium cooking pans are washed with a rough material.
....
....

UNIT 1

Lesson Two

Matter Construction

Worksheet 4

1. What happens when ... ? Why ?

1. Open a bottle of perfume in a closed room for a while. *(St. Joseph Sch. / Cairo 2022)*

....

....

2. Add 100 cm^3 of water to 50 cm^3 of ethyl alcohol.

(Taymour Sch. / Alex. 2022, Orman College Sch. / Giza 2020)

....

....

3. Try to break an iron piece with your hand.

....

....

2. Complete the following :

1. Matter consists of small building units called .... *(Cairo 2020)*
2. Gases are characterized by large .... and very weak .... , so they have .... shapes and volumes. *(Manaret Heliopolis Sch. / Cairo 2020)*
3. .... take the shape of the container, while .... have no definite shape. *(Badr Sch. / Cairo 2023)*

3. Give reasons for :

1. A drop of ink spreads through water.

....

....

2. Solids have definite shapes and volumes. *(Alfarouk Islamic Sch. / Cairo 2022)*

....

....

....

3. It is easy to divide an amount of water into smaller parts. *(Orman College Sch. / Giza 2020)*

....

4. What is meant by the molecule ? Mention the properties of the molecules of matter.

....

....

....

....

....

Worksheet 5

1. A. Give reasons for :

1. Heat changes the matter from the solid state into the liquid state.

....

....

....

2. When water gains energy, it converts into gas.

....

....

....

B. Complete the following :

1. During vaporization process, liquid molecules .... energy and change into .... molecules.
2. The attraction force between molecules of .... is very strong and almost not exist in ....

2. A. Put (✓) or (✗) :

1. The attraction force among molecules of solids are very weak. *(El-Salam Sch. / Luxor 2020)* (   )
2. The motion of the molecules of gas is limited. (   )
3. The intermolecular spaces among the molecules of gaseous matter are small. (   )

B. What is meant by ... ?

1. Melting process : ....

....

2. Vaporization process : ....

....

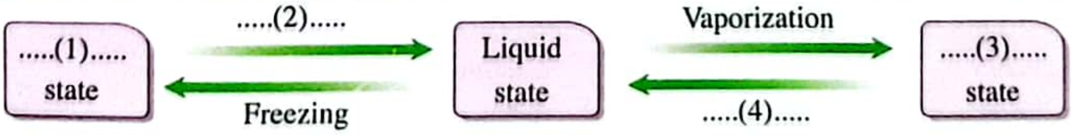
(Port Said 2023)

3. Complete the following table :

Points of comparison	Solid state	Liquid state	Gaseous state
1. Motion of molecules :	....	More free	....
2. Intermolecular spaces :	....	....	....
3. Intermolecular forces :	....	Intermediate	....
4. Volume :	Definite	....	Indefinite
5. Shape :	....	....	Indefinite
6. Example :	....	....	....

4. A. Complete the following diagram :

(St. Joseph Sch. / Cairo 2022)



B. What happens when you ... ?

Heat some water in a beaker to its boiling point. *(El-Agamy / Alex. 2022)*

....

Worksheet 6

1. A. Write the scientific term for each of the following :

1. The simplest pure form of matter which can't be analyzed chemically into simpler form. *(Lycee Bab El-Louk Sch. / Cairo 2020)* (..........................)
2. A substance which is formed from combination of atoms of two or more different elements with constant weight ratios. *(Menofia 2020)* (..........................)
3. A molecule which is formed of similar atoms. (..........................)
4. A compound which is formed of two hydrogen atoms and one oxygen atom. *(West Mansoura Zone / Dakahlia 2020)* (..........................)

B. Choose the odd word out, then write the scientific term for others :

1. Neon – Argon – Oxygen – Xenon. *(Alfarouk Islamic Sch. / Cairo 2022)*
2. Oxygen – Nitrogen – Water – Chlorine.
3. Ammonia – Water – Hydrogen chloride – Aluminium. *(Leaders Sch. / Cairo 2022)*

Odd word	Scientific term
1.	....
2.	....
3.	....

2. Choose the correct answer :

1. All of the following molecules are composed of one atom except ....
   a. argon. b. mercury. c. bromine. d. krypton.
2. Which of the following figures represents the molecule of hydrogen chloride ? ....



a. b. c. d.

3. The molecule of ammonia consists of ....
   a. two atoms of two elements. b. two atoms of three elements.
   c. three atoms of three elements. d. four atoms of two elements.
4. All of the following are compounds molecules except ....
   a. water. b. ammonia.
   c. hydrogen chloride. d. fluorine.

5. All of the following are noble gases except ....

a. hydrogen. b. neon. c. xenon. d. argon.

3. A. Put (✓) or (✗), then correct the wrong one :

1. Oxygen element is a gaseous diatomic molecule.

( ) ....

2. The molecules of the same substance are different from each other.

(Al-Mostaqbal Sch. / Aswan 2020)

( ) ....

3. Hydrogen chloride is an element, while sulphur is a compound.

( ) ....

4. The compound consists of combination of atoms of one element.

( ) ....

B. What is the difference between O_2 & O ?

O_2	O
....	....
....	....

4. A. Complete the following :

1. Hydrogen molecule is composed of .... atom(s), while argon molecule is composed of .... atom(s). *(Menofia 2023)*
2. The liquid element which consists of one atom is .... , while that consists of two atoms is .... *(Cairo 2023)*
3. Molecules of active gases are formed of .... atom(s), while molecules of inert gases are formed of .... atom(s).

B. Compare between element and compound concerning :

Definition – Atoms – Examples.

Points of comparison	Element	Compound
• Definition :	....	....
• Atoms :	....	....
• Examples :	....	....

Worksheet 7 on Lessons One & Two Unit 1

1. Choose the correct answer :

1. Liquid elements are .... *(Ramses College Sch. / Cairo 2020)*

   a. all monoatomic. b. either monoatomic or diatomic.

   c. monoatomic, diatomic or triatomic. d. all diatomic.

2. All of the following are physical properties of matter except ....

   a. density. b. colour. c. taste. d. reaction with oxygen.

3. The mass of the liquid is calculated from the relation..............

   a. density × volume. b. $\frac{\text{density}}{\text{volume}}$

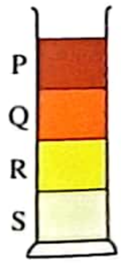
   c. $\frac{\text{volume}}{\text{density}}$ d. density + volume.

4. The smallest part of matter which can exist freely is ....

   a. atom. b. compound.

   c. element. d. molecule. *(West Mansoura Zone / Dakahlia 2020)*

5. Four different liquids were put in a graduated cylinder as in the figure, when they have equal volumes, which one has the biggest mass ? ....



   a. P b. Q c. R d. S

   (Sharm El-Sheikh Zone / South Sinai 2020)

2. A. Put (✓) or (✗), then correct the wrong ones :

1. Equal volumes of different substances have the same masses.

   ( ) ....

2. Mass is the space that is occupied by the body.

   ( ) ....

3. The intermolecular spaces bind the molecules of matter together.

   ( ) ....

B. What is meant by ... ?

1. The mass : ....

2. The molecule : ....

....

(Dokki Zone / Giza 2023)

3. A. Complete the following :

1. Balloons are filled with .... or .... rise up in the air.
2. Alkaline solutions are .... of electricity , while solution of hydrogen chloride in benzene is a .... of electricity. *(West Mansoura Zone / Dakahlia 2020)*
3. .... is the liquid element which is composed of one atom , while .... is the liquid element which is composed of two atoms.

(East Tanta / Gharbia 2022 / Sohag 2020)

B. Give reasons for :

1. Although sugar and table salt have the same shape and colour , we can differentiate between them easily.

   ....

2. Ammonia is a compound molecule.

   ....

4. A. What happens if you ... ?

Put a small quantity of potassium permanganate in a glass beaker containing water.

....

(Futures Sch. / Cairo 2020)

B. Liquid (A) has a mass of 27 gm and a volume of 30 cm^3, while liquid (B) has a mass of 45 gm and a volume of 40 cm^3. *(Ramses College Sch. / Cairo 2020)*

1. Find the density of each liquid.

   ....

   ....

2. If you pour the two liquids into the same container, which liquid will be at the bottom ? And why ?

   ....

   ....

E . P . S Mr. Haitham said

Lesson one

Matter and its characteristics

Matter: anything has mass and volume.

- **Characteristics to differentiate between matter:**

Physical properties of matter:

1. color,taste and smell
2. density
3. Melting point
4. boiling point
5. Hardness
6. Electrical conductivity
7. Thermal conductivity

1. **Color**:
   - Iron – Silver – Gold.
   - We can differentiate them by colors.




Taste:
- Flour – sugar – table salt
- We can differentiate them by tastes





Smell:
- Oil – vinegar – perfume
- We can differentiate them by smells.


Perfume



Important Note:

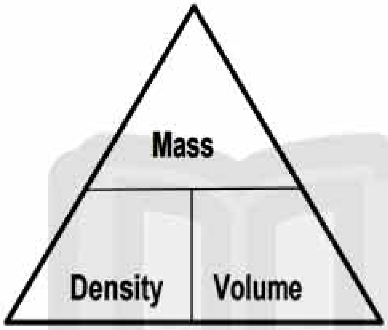


Color, taste and smell can differentiate between some materials because they are
- Tasteless, colorless and odorless
- Some materials are dangerous

m

2. Density.

- **Density:**
  - The mass of unit volume
  - The mass of 1 cm^3
- Measuring unit is **g/cm^3**



Density=Mass÷Volume

Volume=Mass÷Density

Mass=Density×Volume

<u>Problem Models:</u>

1. **A piece of Iron has a volume of 10 cm^3 and a mass of 78 g. Find its density**
   - Density = Mass ÷ Volume
   - Density = 78 ÷ 10 = 7.8 g/cm^3

2. **A piece of wood has a density of 0.4 g/cm^3 and a volume of 20 cm^3. Find its mass**
   - Mass=Density × Volume
   - Mass= 0.4 × 20= 8 g

<u>What is meant by?</u>

1. **The wood has a density of "0.4 g/cm^3 "?**
   The mass of 1 cm3 of wood is 0.4 g

2. **The mercury has a density of "13 g/cm^3 "?**
   The mass of 1 cm3 of mercury is 13 g

Science Activity

To compare between the density of some substances and water



Steps:

Fill a bowl with water and put the following substances

1. A piece of wood
2. An iron nail
3. An ice cube
4. A piece of cork
5. A piece of wax
6. Drops of oil



Observation:

What happens to the following substances?

Put √ in front of the correct one

	Mass	Volume	Density	You know Water density = 1 g/cm³	
				Float	sink
Wax	18 g ÷	10 cm³			
Nail	78 g ÷	10 cm³			
Ice cube	9 g ÷	10 cm³			
Cork	5 g ÷	10 cm³			
Wood	4 g ÷	10 cm³			
Oil	8 g ÷	10 cm³			

Conclusion:

- Substances that have a density **less** than the density of water **float**
- Substances that have a density **more** than the density of water **sink**

Give Reason:

1. **Equal volumes of different materials have different masses.**
1. **Equal masses of different materials have different volumes.**
    1. Because they have different densities

2. **The cork & wood float on the water surface**
    2. Because the density of wood & cork is less than the density of water.

3. **The glass & Iron sinks in the water**
    3. Because the density of glass and Iron is more than the density of water.

Applications on the density:

1. Determination the purity of matter

The change in the density refers to the change in matter quality

- For example.

Determination of the quality of powdered milk, when compared with density the natural milk.

2. Water cannot put out petrol fires. (Give Reason)

Because the density of the oil is less than the density of the water so, it floats over the water and cannot put out fire.

3. Hydrogen or Helium balloons rise up in air. (Give Reason)

Because the density of helium and hydrogen is less than the density of the air so, it rises up in the air.



3,4. Melting point and boiling points.

Melting point:

substance changes from solid to liquid

- **Different solids have different melting points:**
  1. Some solid substances have **low melting points** such as
     - ***Wax***, ***Butter*** and ***Ice***.



  2. Some solid substances have **high melting points** such as
- ***Iron***, ***gold*** and ***Aluminum***



Life Applications:

1. **In making of alloys.**
   a. ***Copper – gold*** **Alloy**: used in making jewels.
   b. ***Nickel – chrome*** **Alloy**: used in making heating coils.
2. **In the manufacture of cooking pans from aluminum.**
   Because, Aluminum has high melting point.

Boiling point:

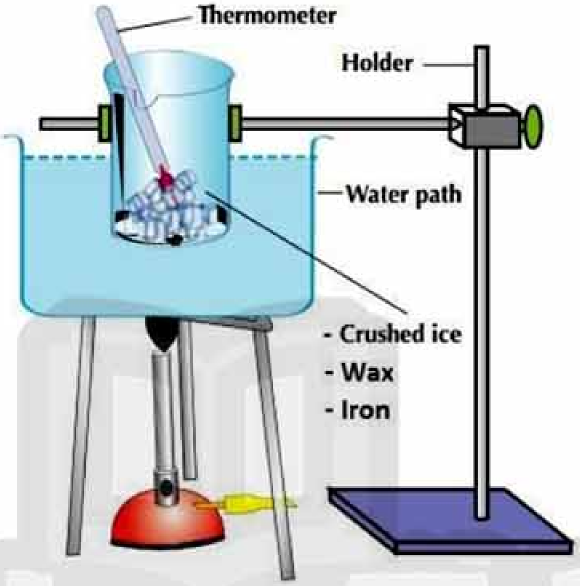
The temperature at which The substance changes from the liquid state to the gaseous state

Life application on boiling process :

Separation of the components of petroleum oil .

Science Activity

To study matter and the melting point (fusion point)



Steps:

1. Put a beaker containing (ice – wax – iron) in a water bath
2. Put the water bath on a flame for a period of time
3. Use the thermometer to stop heating at 100

Observation:

What happens when you heat the following substances to 100°c?

Put √ in front of the correct one

	Ice		Wax		Iron	
	Melts	Doesn't melt	Melts	Doesn't melt	Melts	Doesn't melt
At 5 °c						
At 40 °c						
At 100 °c						

Conclusion

- Each substances have a different melting point.
- Some substances have a low melting point [butter, ice, wax]

5. Hardness.

- Some solid substances are soft at the room temperature
- (Rubber – Plastic – Clothes)
- Some solid substances need heat to be soften
- (Iron – Copper – Aluminum)
- Some solid substances do not melt by heating
- (Coal – Sulphur – Wood)

Life Applications on Hardness:

1. **Iron is better than Copper in concrete buildings. (Give Reason)**
   Because, iron is harder than copper.



2. **Screwdrivers are made of steel iron. (Give Reason)**
   Because it is very hard.



6. Thermal conductivity

Heat Conductors	Heat Insulators

Heat Conductor



Heat Insulator

Substances that allow heat to flow	Substances that do not allow heat to flow
• Iron	• Wood
• Copper	• Plastic
• Aluminum	• Air

7. Electric conductivity

Electric Conductors	Electric Insulators
Substances that allow electricity to flow	Substances that don't allow electricity to flow
• Metals as (*Iron*, *Copper* and *Aluminum*)	• Non-Metals as (*Wood*, *Sulphur* and *Plastic*)



Electric Conductor **Electric Insulator**

Electric Conductors	Electric Insulators
• Salt solution • Acidic solution (lemon) • Alkaline solutions (shampoo) • Water	• Sugary solutions • Air • Benzene • Oil

Life Applications on Electric & Thermal Conduction:

1. **Electric wires (cables) are made of copper or Aluminum.**
   Bec. They are electric conductors.



2. **Electric wires (cables) are covered with Plastic**
   Bec. Plastic is electric insulator.

3. **Cooking pans are made of Aluminum.**
   Bec. They are heat conductors.



4. **Handles of cooking pans are made of plastic or wood.**
   Bec. They are heat insulator.

#.Metals & chemical activity.

Very active metals	Less active metals	Inactive metals
They lose their luster once they exposed to air	They rust after long time exposed to air	They don't react with air
Sodium – potassium	Iron – aluminum – copper	Silver – gold
		

Life Application on chemical Activity:

1. **Sodium loses its luster if exposed to the atmospheric air. (Give Reason)**
   Bec. It is very active metals.



2. **Steel bridges are coated with inactive material. (Give Reason)**
   To protect the iron from rust.

3. **Iron rust while exposing to the air. (Give Reason)**
   Bec, it is a less active metal.

Lesson Review

Q1: Complete the following:

1. Matter is anything that has ------------------- and -------------------
2. We distinguish between gold and silver by their different --------------------------
3. We differentiate between table salt and sugar by their different ------------------
4. We differentiate between perfume and vinegar by their different --------------
5. Density is the mass of ---------------------------------
6. Golden jewels are made of -------------------------------- Alloy, while the heating coils are made up of -----------------------------Alloy.
7. The measuring unit of density is ---------------------------
8. Equal volumes of different substances have different ------------------------ because they have different densities.
9. Melting point is --------------------------- at which substances change from solid state to ---------------------------- state.
10. There are materials don't soften by heating such as ---------------------------
11. Electric insulators are made up of materials such as ------------------------------ and --------------------------------
12. Jewels are made of ---------------------------------- alloy, while heating coils are made of --------------------------.
13. There are good conductors of electricity and heat such as ----------------------- and ------------------- while there are bad conductors of electricity and heat such as ----------------------------- and --------------------------------
14. Active metals lose their --------------------- when they are exposed to moist air.
15. Gases are ----------------------------- conductors of electricity.
16. Acidic solution is ------------------------ conductor of electricity.

Q2: Choose the correct answer:

1. **The color property is a distinguishing factor between -----------------**
   a. table salt and flour b. iron and gold
   c. oxygen and nitrogen d. oxygen and carbon dioxide

2. **The measuring unit of density is ----------------------**
   a. gm/m^3 b. gm/cm
   c. gm/cm^3 d. gm/cm^2

3. **Handles of Cooking pans are made of ----------------------------**
   a. Iron b. plastic
   c. aluminum d. stainlesssteel

4. **Equal masses of different substances have different --------------------**
   a. volumes only b. densities only
   c. lengths only d. volumes and densities

5. **The handles of cooking pans are made of ----------------------------**
   a. Iron b. plastic
   c. wood d. wood and plastic

6. **All the following solutions conduct electricity except -------------------**
   a. Salt solution b. Alkaline solution
   c. acidic solution d. sugary solution

7. **All the following substances are heat conductors except ----------------**
   a. Wood b. aluminum
   c. copper d. iron

8. **The property of electrical conductivity is a distinguishing factor -----------**
   a. wood andplastic b. no correct answer
   c. iron and wood d. iron and copper

9. **One of the elements which don't react with oxygen of air is --------------**
   a. Potassium b. Sodium
   c. Aluminum d. Gold

Q3: Give Reason for the following:

1. Wood floats over the water surface while iron sinks.

----

2. Equal masses of different substances have different volumes.

----

3. Balloons filled with Helium and Hydrogen rise up in the air.

----

4. Water cannot put out Petrol fire.

----

5. We use Aluminum in making cooking pans.

----

6. Steel bridges are painted with inactive material.

----

7. It is preferable to use iron with concrete in building than copper

----

----

8. Sodium loses its luster once it exposes to the atmospheric air.

Q4: Problems:

1. A piece of iron has a mass of 30 kg and a volume of 0.3 m^3. Find its density

----

----

2. An amount of milk has a mass of 300 g and a density of 0.6 g/cm^3.Find it volume

----

Q5: What is meant by?

1. The density of water is 1 g/cm^3.

----

2. The density of mercury is 13 g/cm^3.

----

3. The melting point of iron is 1538 °C

----

4. The boiling point of water is 100 °C

Lesson Two:

Matter Construction

Molecules:

It is the smallest building unit of the matter that can exist freely

- **Properties of the molecules of matter:**
  1. Molecules keep the properties of matter
  2. Molecules are in a state of continuous motion in all directions
  3. There are spaces between the molecules of matter
  4. There are forces between the molecules of matter

Intermolecular spaces:

The spaces between the molecules of the matter.

Intermolecular force:

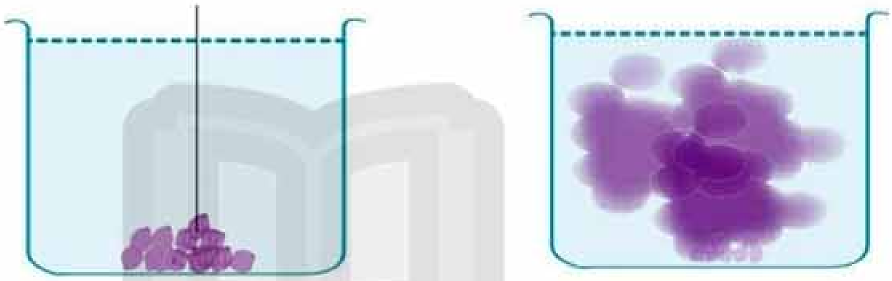
The force connects the molecules of the matter together.

Molecules	Solid state	Liquid state	Gaseous state
Motion	Vibrate **Limited**	Slide past each other **Free**	Fast, randomly **Completely Free**
Intermolecular spaces:	Very narrow	Far	Very far
Intermolecular forces:	Strong	Weak	Very weak
Volume:	Definite	Definite	Indefinite
Shape:	Definite	Indefinite	Indefinite

Science Activity

1. **The matter consists of tiny molecules which are in a continuous motion:**

Permanganate



Observation:

- What happens when you add some permanganate [violet] to a beaker contains an amount of water?

Put √ in front of the correct one

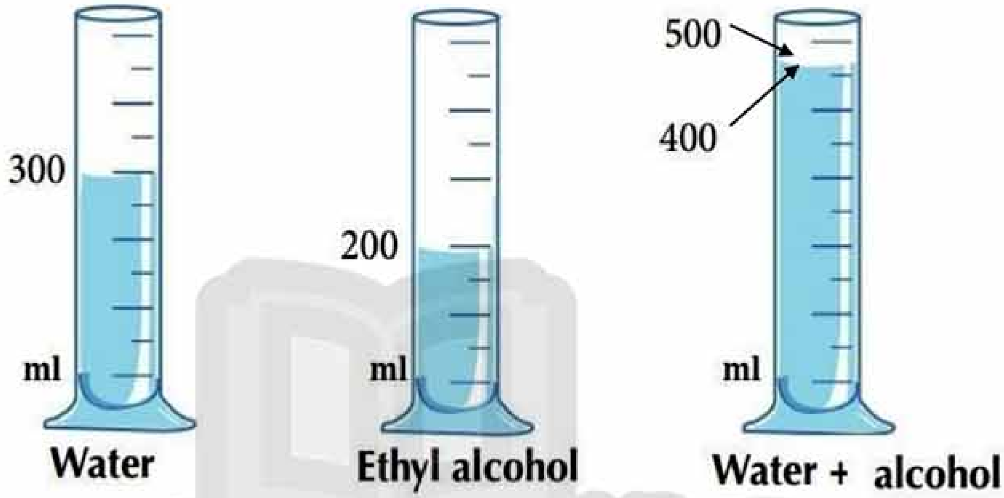
The violet colour stays in place	
The violet colour doesn't spreads all over the water	
The violet colour spreads all over the water	

Conclusion:

- The matter consists of tiny parts called Molecules
- Molecules of matter are in a state of continuous motion.

Science Activity

2. The presence of intermolecular spaces between the molecules of matter.



Observation:

What happens when you add 300 ml of water to 200 ml of alcohol then observe the total volume?

Put √ in front of the correct one

The total volume = 500 ml	
The total volume is less than 500 ml	
The total volume is more than 500 ml	

Conclusion

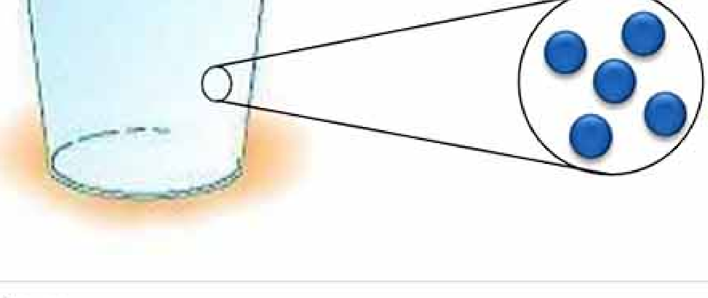
- There are intermolecular spaces between the molecules of matter.
    - **Explanation,** As the molecules of the alcohol fill the intermolecular spaces of the water

Give Reason:

1. **When you put a drop of ink in the water, it spreads.**
   Because the ink molecules have a continuous motion in all direction
2. **Solids have definite shape and volume.**
3. **It is hard to break iron rod.**
   Because Iron has very strong intermolecular forces.
4. **Liquids have indefinite shape and definite volumes.**
5. **It is easy to make an amount water into portions.**
   Because they have weak intermolecular forces.
6. **Gases have indefinite volume and shape.**
   Because gases have very weak intermolecular forces

Changes of matter:

1. Melting:
   The change of matter from solid state to liquid state by heating.
   - **Matter changes from solid state to liquid state by heating. (G.R)**
     Because the energy of molecules increase so they move faster, and the spaces increase then changes into liquid



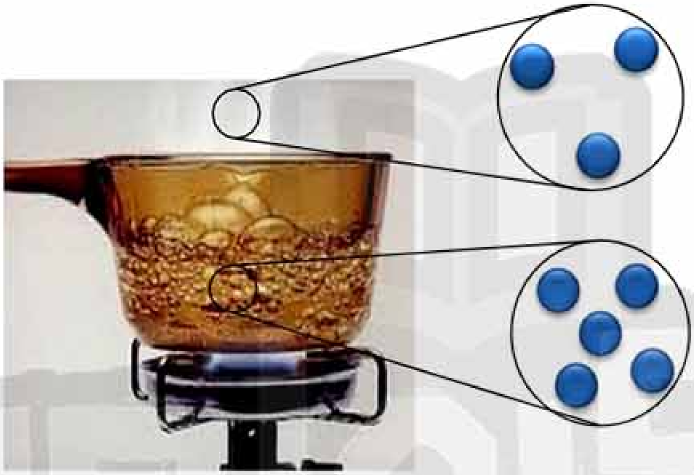
Ice Molecules
- Vibrate In place
- Regular pattern

Water Molecules
- Slide past each other
- Random shape

Changes of matter:

2. **Vaporization:**
   The change of matter from liquid state to gas state by heating.

   - **Matter changes from liquid state to gas state by heating. (G.R)**
     Because the energy of molecules increase so they speed increase, and the spaces increase then changes intogas



Vapor Molecules
- Completely free
- Random shape

Water Molecules
- Slide past each other
- Random shape

Important Note:

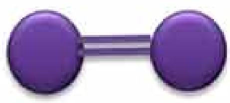
- The molecules composed of tiny particles called Atoms.
- **Atom**: The basic building unit of molecule, which cannot exist freely.

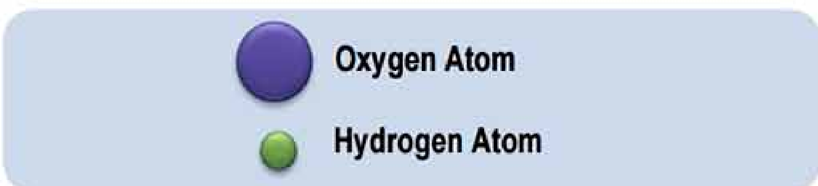
Example:

Water Molecule



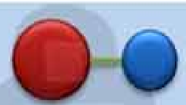
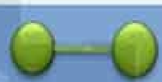
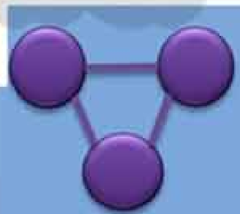
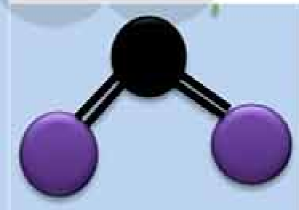
Oxygen Molecule





Types of Molecules:

Types of Molecules	
Molecules of an elements	**Molecules of a compound**
Element: • The simplest form of matter that don't break down into simpler substance. **It is a substance composed of similar kind of atoms.**	**Compound:** • The chemical combination of two or more elements with fixed ratio. **It is a substance composed of different kinds of atoms.**
Example	**Example**

(Na) sodium		**($NaCl$) table Salt**	
(H_2) Hydrogen		**(H_2O) Water**	
(O_3) Ozone		**(CO_2) Carbon dioxide**	

Important Note:

— **Elements may be solid, liquid or gas**

— **Elements may be**

- **Monoatomic**: composed of one atom (Iron)
- **Diatomic**: composed of two atoms (Oxygen)
- **Triatomic**: composed of three atoms (Ozone)

Types of elements:

Types of Elements	**Solids**	**Mono-atomic**	- Carbon (C) - Silver (Ag) - Sodium (Na) - Iron (Fe) - Calcium (Ca)
	Liquids	**Mono-atomic**	Only Mercury (Hg)
		Di-atomic	Only Bromine (Br_2)
	Gases	**Mono-atomic**	**Inactive gases** - Helium (He) - Neon (Ne)
		Di-atomic	**Active gases** - Oxygen (O_2) - Hydrogen (H_2)

Important Note:

— Compounds may be <u>solid</u>, <u>liquid</u> or <u>gas</u>

— Compound are made up of different elements and atoms

How many elements and atoms? Na_2SO_4

Capital Letters = Elements	Lower Numbers = Atoms
— **Count the capital letters**	— **Count the lower numbers**
N, **O**, **S** → **3 Elements**	**Na = 2**, **S = 1**, **O = 4** → **7 Atoms**

<u>**Chemical formula:**</u>

A set of chemical symbols represent the number and the kind of elements.

Name of the molecule	Chemical formula	Number of atoms	Number of elements
1. Water	H_2O	3	2
2. Sodium chloride	NaCl	2	2
3. Ammonia	NH_3	4	2

Lesson Review

Q1: Complete the following:

1. The ------------------------ is the basic building unit of matter
2. The molecules have intermolecular ------------------------- and ------------------
3. The solids have ------------------- shape and ---------------------- volume.
4. The gases have -------------------- shape and ------------------------ volume.
5. The liquids have ----------------------- shape and ----------------------- volume.
6. The ----------------------------- is the simplest form of matter that cannot be analyzed (broken down)
7. Melting process is the change of matter from -------------------- to ----------------
8. Evaporation process is the change from ------------------- to -------------------
9. When the any substance is heated the intermolecular spaces -------------------- --- and the intermolecular forces ----------------------
10. The molecules composed of tiny particles whish are called -----------------------
11. The molecules of element composed of ------------------------- atoms.
12. The molecules of a compound composed of ------------------------- atoms.
13. Some solid element composed of one atom such as --------------------------- and other liquids composed of one atom such as --------------------------- while other have two atoms such as ---------------------------
14. Gaseous elements composed of one atom such as………………………………, while other gaseous elements have two atoms such as……………………………
15. The chemical formula is a set of --------------------------------- shows the numbers and the kind of elements.

Q2: Give Reason:

1. When you put a drop of ink in the water it spreads in the whole water

----

----

2. It is hard to break iron rod

----

3. It is easy to make an amount water into portions

----

4. Solids have definite shape and volume.

----

5. Liquids take the shape of the container.

----

6. Gases take the shape and the volume of the container.

----

7. Solids changes to liquid by heating.

Q3: How many atoms and elements are in the following molecules?

1. NH3 (Ammonia gas)
   - ------------------ atoms, ----------------element
2. H2SO4 (Sulphuric Acid)
   - ---------------- atoms, ---------------- element

Q4: What happens when?

1. You put a drop of ink in the water.

----

2. You heat a piece of iron strongly.

----

3. You add 300 ml of water to 200 ml of alcohol and observe the total volume.

Q5: Compare the elements molecule and the compound molecule:

	Element molecule	Compound molecule
Definition		
Atoms		
Example		

Lesson 1 Sheet 1

Complete:

1)…………………,……………and……………….are from physical properties of matter

2)Density is ………..of unit volume of substance and its measuring unit is ……………

3)………..and…….are from low melting points substances

4)………..and………are from high melting points substances

5)An alloy of ………………… is used in making jewels , while an alloy of ………. Is used in making heating coils

6)……………. And gold are …………. Metals, while ………… And ………are active metals

7)…………and……….solutions are good conductors of electricity

8)…………and………..solutions are bad conductors of electricity

9) Gases are ………..conductors of electricity

10) Boiling point is …………at which substance change from ………..state to ………..state

What is meant by :

1) Melting point :

………

2) Density

………

3) the Density of water is1 gm/cm

………

4)the boiling point of water =100

………

Give reasons for :

1)Equal volumes of different substances have different masses

………

2)Water is not used to put out petrol fires

………

3) Iron nail sinks in water, while cork floats on water

……….

4) Ice changes into water when it is left in air

……….

5) Sodium loses its metallic luster when exposed to moist air

………

Problems

1) **Calculate the Density** of iron cube, whose mass 70.2 gm and its volume 9

………

……….

2) When a piece of iron of mass 78 gm is put in graduated cylinder containing 100cm^3 the reading of the cylinder becomes 110cm . **Calculate the Density of iron**

………

………

3) If you know that *the volume of water in cylinder = 80

**the volume of water +piece of rock = 100cm

***the mass of the piece of rock =50 gm **Calculate the Density of the rock**

………

………

………

Lesson 1 Sheet 2

Complete:

1)…………….is the measuring unit of mass, while …………is the measuring unit of volume

2) Separation of petroleum components depends on the difference in their ………..

3)Electric wires are made up of ………………as they are ………conductors of electricity

4)…………………can float on water ,while ……………………..sink in water

5)…………and…………..are very active metals , while………..and…………..are inactive

6) Density = ——————

7) the mass of one cubic centimeter of matter known as …………………..

8)……………………don't become soft by heating

9)Alloy of ………………..is used in making jewels ,while alloy of …………..is used in making heating coils

10)you can differentiate between gold and silver by their different……………..

Write the scientific term

1) The space occupied by a substance (………………………….)

2) the temperature at which a substance begins to change from the solid state to liquid state (……………………)

3) Metals react with oxygen and lose their metallic luster **(…………………)**

4) Metals that find great difficulty to react with oxygen when exposed to humid air (………………………..)

What is meant by :

1) Density ……………………………………………………………………………………………….

2) Boiling point ………………………………………………………………………………………

3) The density of iron is 7.8 gm/ ………………………………………………………….

4) The melting point of ice is 0℃ ……………………………………………………………

Give reason:

1) Equal masses of different substances have volumes

………

………

2) iron rods not copper rods are used in building concrete houses

………

………

3) potassium and sodium are kept under kerosene surface

………

………

4) gold and silver are used in making jewels

………

Problems:

1) The density of copper is 8.8 gm/ **,find** the volume of 500 gm of copper

………

………

2) Apiece of marble , whose mass is 100 gm is immersed in measuring cylinder containing water, then water raised from 40 cm^3 to 60 **.** **What's** the density of marble??

………

………

3) A piece of iron has a mass of 30 kg and volume of 0.3 **. find** its density

………

………

Lesson 2 Sheet 1

Complete:

1) ……………………..is the building unit of matter

2)The intermolecular spaces between solid molecules are…………., but ……………in gases

3)……………….Take the shape of container, while………………has no definite shape

4)Melting process is the change of matter from…………………..to……………………

5)Helium is considered from …………………..and its molecules is composed of……………

6)The liquid element which consists of one atom is…………., while that consists of two atoms is ……………………………

7)Hydrogen molecule is composed of ……………atom, while Argon molecule is composed of ………………………………atom

8)Ammonia gas (NH_3) consist of………….atoms , ……………..elements

9)Element molecule formed of ………………atoms

10)Compound molecule formed of ………………atoms

Give reason:

1)The odour of perfume spreads all over the room when the bottle is opened

……

……

2)When adding an amount of table salt to water it disappears after a time

……

……

3)It is difficult to break down a piece of iron

……

……

4)It is easy to divide an amount of water into smaller parts

……

5)Oxygen is an element molecule , while hydrogen chloride is a compound

………

………

Write the scientific term:

1) The simplest form of matter which can't be analyzed into simpler form (…………………)

2) The result of combination between 2 or more atoms of different elements with constant weight ratios (……………………….)

4) The compound molecule formed of 2 hydrogen atoms and 1 oxygen atom (………………)

Lesson 2 Sheet 2

Choose:

1)The motion of solid molecules is

a)Limited　　　　b)Unlimited

c)Completely free　　　　d)The most

2) The intermolecular spaces among the molecules of oxygen gas is

a) Medium　　　　b) Very large

c)Very small　　　　d)No correct answer

3)The………..matter doesn't take the shape of the container

a)Solid　　　　b)Liquid

c)Gaseous　　　　d)No correct answer

Complete

1) The attraction force among gases molecules is ……………………
2) The state of matter depends on…………………..and……………… between molecules
3) Chlorine molecule is composed of ……………..atom, while xenon molecule is composed of ……………..atoms

4) The molecule of water is formed due to the combination of………atoms with……atom
5) Sodium chloride is consists of ……………..atom,………………element

Give reason

1)Gases have indefinite shapes and volumes

………

………

2)A drop of ink spreads through water

………

………

3)The change of matter by heating from solid state to liquid state

………

………

4) The molecule of helium differs from the molecule of hydrogen

………

………



October Revision

Mr. Ahmed Elbasha

✹ (1) Write the scientific term :

1)	Imaginary places in which electrons can move according to their energies.	(..............................)
2)	The result of combination between two or more atoms of different elements with constant weight ratios.	(..............................)
3)	The gases that do not take part in the chemical reaction.	(..............................)
4)	It is the temperature at which a substance begins to change from a liquid state into a gaseous state.	(..............................)
5)	It is the amount of energy lost or gained by an electron when it transfers from one energy level to another.	(..............................)
6)	The positively charges particles in the nucleus of an atom.	(..............................)
7)	The spaces that found among the molecules.	(..............................)
8)	The temperature at which matter starts to change from solid to liquid.	(..............................)
9)	The limited amount of energy needed or loss to transfer an electron from an energy level to another.	(..............................)
10)	The simplest pure form of a matter which can't be analyzed simpler.	(..............................)
11)	The fundamental building unit of matter that can take part in the chemical reaction.	(..............................)
12)	Number of positive protons in nucleus of the atom.	(..............................)
13)	The mass of unit volume of the substances.	(..............................)

14)	Sum of protons and neutrons in a nucleus.	(..................................)
15)	The smallest part of matter that can exist freely having the properties of matter.	(..................................)
16)	The monoatomic liquid.	(..................................)
17)	The atom that gains a quantum of energy.	(..................................)
18)	The spaces between molecules.	(..................................)
19)	The sum of positive protons and neutral neutrons in the nucleus of atom.	(..................................)
20)	Volume measuring unit.	(..................................)
21)	A liquid used to keep sodium and potassium metals from air.	(..................................)
22)	The matter which doesn't take the shape of the container.	(..................................)
23)	The result of combination between two or more different elements with constant weight ratios.	(..................................)
24)	It is the mass of unit volume of the substance.	(..................................)

✹(2) Choose the right answer:

1.The colour property is a distinguishing factor between ....

a. Flour-sugar. b. silver-gold. c. oxygen-helium.

2.The third energy level is saturated by .... electrons.

a. 2 b. 18 c. 8

3.A substance is solid and can't be soften by heating ....

a. copper. b. sulphur. c. aluminum.

4.The chemical activity of the element depends on the number of ....

a. neutrons. b. protons. c. electrons in the outer level. d. levels filled with electrons.

5.An element has 2 electrons in the (L) level, so its atomic number is ....

a. 2 b. 4 c. 6 d. 8

6.All of the following are active elements except ....

a. ${}_{1}H$ b. ${}_{6}C$ c. ${}_{7}N$ d. ${}_{18}Ar$

7.The substances that float on water surface is ....

a. iron . b. cork. c. aluminium. d. copper.

8.The property of electric conduction is distinguishing factor between ....

a. iron and copper. b. wood and plastic.

c. iron and wood. d. no correct answer.

9.When a substance sinks in water, that means its density is .... the density of water.

a. equal to b. less than c. more than

10.The .... matter doesn't take the shape of the container.

a. solid b. liquid c. gaseous

11.The molecule of oxygen is composed of .... atom(s).

a. one b. two c. three

12.The particles which revolve around the nucleus of an atom of element are ....

a. neutrons. b. protons. c. electrons.

13.The number of energy levels in the heaviest atoms is ....

a. 7 b. 8 c. 32 d. 18

14.From inert gases ....

a. nitrogen. b. helium. c. oxygen. d. bromine

15.Taste property is a distinguishing factor between ....

a. copper and iron. b. vinegar and perfume. c. salt and sugar. d. gold and silver.

16.Atom symbol of potassium element is ....

a. Hg b. Cu c. P d.K

17.Some substances need heat to get soften such as ....

a. coal. b. iron. c. sulphur. d. rubber.

18.The handles of cooking pots are made of ....

a. copper. b. aluminium. c. wood. d. iron.

19.Solids have .... intermolecular force.

a. strong b. weak c. medium d. no correct answer

20.When the atomic number of element equals its mass number, this means that there is no ....

a. electrons. b. protons . c. neutrons. d. nucleus.

21.The molecule of gaseous element that consists of one atom is ....

a. oxygen. b. hydrogen. c. helium. d. mercury.

22.The molecule of ammonia consists of .... atoms.

a. 2 b. 6 c. 4 d. 1

23.The number of atoms is equal to the number of elements in .... molecule.

a. water b. hydrogen chloride c. oxygen d . ammonia gas

24.The nucleus of .... atom doesn't contain neutrons.

a. neon b. hydrogen c. oxygen d . no correct answer

25.The energy level N is saturated by .... electrons.

a. 8 b. 18 c. 32

26.The third energy level is saturated by .... electrons.

a. 2 b. 10 c. 18 d. 8

27.Heating coils are made up of .... alloy.

a. iron-copper b. nickel-iron c. chrome-copper d. nickel-chrome

28.The electron is .... charged particle.

a. positively b. negatively c. neutrally

29.................... is the monoatomic liquid molecule.

a. Bromine b. Mercury c. Iodine

30.The number of electrons that saturates the level (K) is ....

a.8 b.2 c.32

31.The density of petroleum oil is .... that of water.

a. less than b. more than c. equal to d. no correct answer

32.Positive charged particles in the nucleus of atom are ....

a. neutrons. b. protons. c. electrons.

33.Potassium is symbolized by ....

a.P b. K c. B

34.Density measuring unit ....

a.cm^3. b. gm. c. gm./cm^3

35.The monoatomic liquid is ....

a. Hg b. Ag c. Mg d.Br

36.The rule which is used to find the electronic configuration for the first four energy levels is ....

a. 22n b. $2n^2$ c. 2n d. n^2

37.The symbol which represents silver element is....................

a. S b. Si c .Au d. Ag

✸(3) Complete the following :

1. The liquid element its molecule is composed of one atom is .... , while that composed of two atoms are ....
2. Some solutions are good conductors of electricity as .... and .... , while others are bad conductors of electricity as ....
3. A piece of metal its mass is 25 g. and its volume is 10 cm^3 , when it is placed in water it will .... (water density 1 g/cm^3.)
4. Substances are solids which cannot be soften if heated as .... and ....
5. Density is the .... of unit volume of a substance and its measuring unit is.........
6. An alloy of .... is used in making jewels, while an alloy of .... is used in making coils.
7. Smallest part of the element that can take part in a chemical reaction is ....
8. The symbol of sodium atom is .... while that of sulphur atom is ....
9. The monoatomic liquid is .... , while .... is diatomic liquid.
10. Some solutions are good conductors of electricity as .... solution, while some solutions don't conduct electricity as .... solution.
11. The hydrogen molecule is consisted of .... atoms, while the argon molecule (inert gas) is consisted of .... atom.
12. The matter is composed of small units called .... , while these units are consisted of smaller units called ....
13. The chemical symbol of iron element is .... , while S is the chemical symbol for .... element.
14. The attraction force among the molecules of copper is .... than that between molecules of water is ....

15. The matter in .... state has a definite shape and definite volume.

16. Liquid element its molecule is composed of one atom is .... , while that composed of two atoms is ....

17. .... is the amount of energy gained or lost to transfer an electron from an energy level to another.

18. The electron has .... charge, while the proton has .... charge .

19. .... is the sum of protons and neutrons.

20. The liquid that is consists of one atom is ....

21. Silver symbol is .... whereas sodium symbol is ....

22. .... and .... are very active metals.

23. The atom nucleus contains .... and ....

24. .... is soft at room temperature, while .... can't be soften.

25. The symbol of potassium atom is .... , while the symbol of silver atom is ....

26. .... is from very active metals but .... is from inactive metals.

27. Silver symbol is .... ,whereas sulphur symbol is ....

28. The number of energy levels in the largest known atom is ....

29. In the melting process, solid molecules .... energy and change into .... state.

✹(4) Correct the underlined words:

1	**Hydrogen** is from inert gases.	(…………………………)
2	**Bromine** is the only liquid metal that its molecule consists of one atom.	(…………………………)
3	**Gold** is from very active metals.	(…………………………)
4	**Mass number** is known as the number of protons existed in an atom nucleus of an element.	(…………………………)
5	An atom third level is saturated with **8** electrons.	(…………………………)
6	The liquid element which its molecule consists of two atoms is **mercury**.	(…………………………)
7	The relation $2n^2$ determines the number of **neutrons** in energy level.	(…………………………)
8	**Wood** is a good conductor of heat and electricity.	(…………………………)
9	The density equals mass divided **area**.	(…………………………)
10	The molecules of inert gases consist of **two** atoms.	(…………………………)
11	Iron and copper are **bad** conductors of heat.	(…………………………)
12	The chemical symbol of silver is **Si**.	(…………………………)
13	**Ammonia** molecule consists of two atoms of hydrogen and one atom of oxygen.	(…………………………)
14	The electron can transfer to a higher energy level if it **loses** energy.	(…………………………)
15	Carbon is symbolized by **Ca**.	(…………………………)
16	Aluminum is from **liquid** elements.	(…………………………)
17	The atom mass is concentrated inside the **electrons**.	(…………………………)
18	**Gold** is from very active metals.	(…………………………)
19	The relation ($2n^2$) is not applied to energy level higher than **5th** level.	(…………………………)

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Whatsapp : 01003494547

✹(5) Give reason for:

1.The atom is electrically neutral.

....

2.The rule ($2n^2$) is not applied on the energy levels greater than four.

....

3.Wood piece floats on water surface

....

4.The volume of a mixture of water with alcohol is less than sum of their volumes before being mixed together.

....

5.Neon is an inert gas.

....

6.Water is not used to put out petroleum fire.

....

7.Handles of cooking pans are made up of wood or plastic.

....

8.It is easy to divide an amount of water into smaller parts.

....

9.Inert gases can't share in chemical reactions.

....

10."K" energy level is filled with electrons before "L" energy level

....

11. On adding 50 cm^3 of alcohols to 50 cm^3 of water the total volume not equal 100 cm^3

....

12. The nucleus of the atom is positively charged.

....

(6) What happen if:

1. Three atoms of hydrogen combine with one atom of nitrogen.
   ....
2. Using water in putting out petrol fires.
   ....
3. Leaving a piece of iron exposed to air.
   ....
4. A liquid substance is heated.
   ....
5. Putting of a drop of ink in water.
   ....

(7) Put (√) or (X) :

1. The intermolecular spaces among molecules of solids very large.	( )
2. Heating coils are made up of nickel-chrome alloy.	( )
3. Intermolecular spaces are tiny in solids.	( )
4. From substances that float on the surface of water is copper.	( )
5. Molecules of the same substance are different from each other.	( )
6. The electrons are distributed to fill the "K" level before filling the "L" level.	( )
7. Argon atom ($_{18}Ar$) has four energy levels .	( )
8. The energy level "K" has the highest energy.	( )
9. The motion of gaseous molecule is limited.	( )
10. The distance among solid molecules is very large.	( )
11. The compound consists from a combination of atoms of one element.	( )
12. As we go further from the nucleus , the energy of the energy level decreases.	( )
13. Mercury is a liquid element that its molecule composed of one atom.	( )
14. Inert gases are monoatomic.	( )
15. The hydrogen molecule consists of two hydrogen atoms.	( )
16. The intermolecular forces are very strong in gases.	( )
17. The mass number is the number of protons and electrons.	( )
18. The motion of gases is completely free.	( )

✸(7) Give one difference between each of the following :

1. **Neutron and proton.**

....

....

2. **Intermolecular forces in solids and in gases.**

....

....

3. **Ammonia molecule and nitrogen molecule.**

....

....

4. **Element and compound.**

....

....

5. **Potassium and gold. (according chemical activity).**

....

....

6. **Hydrogen and Helium. (According to the number of atoms in its molecule)**

....

....

✹(8) What is meant by ... ?

1. Matter.

....

....

2. Quantum.

....

....

3. The excited atom.

....

....

4. Atom.

....

....

5. The melting point of ice= zero degree Celsius.

....

....

6. Mass number of sodium is 23.

....

....

7. The melting point.

....

....

8. The density of water is 1 gm/cm^3

....

....

(9) Problems :

1

Transfer the following table to your answer paper and fill it :

Element symbol	Atomic number	Mass number	Number of protons	Number of electrons	Number of neutrons
$^{14}_{7}N$	....	....	....	....	....
$^{12}_{6}C$	....	....	....	....	....

....

....

....

....

2

On determining iron density using a piece of iron of mass 78 gm. The piece is immerged in 100 cm^3. of water, the water increases up to 110 cm^3. Calculate iron density.

....

....

....

....

3

In an experiments to determine water density, the following results are recorded :

1. Mass of an empty glass beaker= 56 g.
2. Mass of the beaker containing water = 156 g.
3. Volume of the water measured by a graduated cylinder= 100 cm^3.

Calculate the water density.

....

....

....

....

4

Draw the electronic configuration for each of the following elements :

1. $^{40}_{18}Ar$ 2. $^{7}_{3}Li$ 3. $^{24}_{12}Mg$ 4. $^{19}_{9}F$

....

....

....

....

5

When a piece of iron its mass 156 gm. is put in a graduated cylinder containing 100 cm^3 of water the reading becomes 120 cm^3 **Calculate the density of iron.**

....

....

....

6

Write the electronic configuration of the following atoms :

1. $^{23}_{11}Na$ 2. $^{40}_{20}Ca$

....

....

....

....

7

Write the electronic configuration of the following elements, then :

1. $^{7}_{3}Li$ 2. $^{24}_{12}Mg$

- Find the number of electrons in the outermost energy level in each atom.

- Calculate the number of neutrons in each atom.

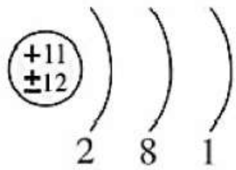
8

Write the electron configuration of the following :

1. $_{11}Na$ 2. $_{17}Cl$ 3. $_{12}Mg$ 4. $_{3}Li$

9

The figure represents the electronic configuration of the atom of an elements
Determine :

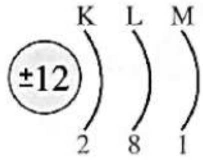


1. The atomic number.
2. The mass number.
3. The number of energy levels.
4. The number of electron in the last energy level.

10

Look at the opposite figure, then answer :

1. Find number of protons.
2. Find the mass number.
3. Find the atomic number.
4. Find this element activity.



11

Write electronic configuration for :

1. $_{19}K$
2. $_{9}F$
3. $_{13}Al$
4. $_{10}Ne$

Model Answer

(1) Write the scientific term:

1. Energy level
2. Compound
3. Inert gas
4. Boiling point
5. Quantum
6. Protons
7. Intermolecular space
8. Melting point
9. Quantum
10. Element
11. Atom
12. Atomic number
13. Density
14. Mass number
15. Molecule
16. Mercury
17. Excited atom
18. Intermolecular species
19. Mass number
20. Cm^3
21. Kerosene
22. Solid
23. Compound
24. Density

(2) Choose the right answer:

1. B
2. B
3. B
4. C
5. B
6. D
7. B
8. C
9. C
10. A
11. B
12. C
13. A
14. B
15. C
16. D
17. B
18. C
19. A
20. C
21. C
22. C
23. B
24. B
25. C
26. C
27. D
28. B
29. B
30. B
31. A
32. B
33. B
34. A
35. A
36. B
37. D

(3) Complete the following :

1. Mercury – bromine
2. Acidic - alkaline - Sugary solution
3. Sink
4. Sulfur – coal
5. Mass – gm/cm^3
6. Gold-copper - nickel-chrome
7. Atom
8. Na – S
9. Mercury – bromine
10. Salt – sugary
11. Two – one
12. Molecule – atom
13. Fe – sulfur
14. Strong – weak
15. Solid
16. Mercury – bromine
17. Quantum
18. Negative – positive
19. Mass no.
20. Mercury
21. Ag – Na
22. Sodium – potassium
23. Proton – neutron
24. Rubber – carbon
25. K – Ag
26. Sodium – silver
27. Ag – S
28. Seven
29. Gain – liquid

(4) Correct the underlined words:

1. Helium
2. Mercury
3. Sodium
4. Atomic number
5. 18
6. Bromine
7. Electrons
8. Iron
9. Volume
10. One
11. Good
12. Ag
13. Water
14. Gain
15. C
16. Solid
17. Nucleus
18. Sodium
19. 4^{th}

(5) Give reason for:

1. Because the number of negative electrons which revolve around the nucleus is equal to the number of positive protons in the nucleus.
2. Because the atom becomes unstable if the level contains more than 32 electrons.
3. Because the density of wood is less than that of water
4. Because some molecules of alcohol enter the intermolecular spaces among water molecules
5. Because the outermost energy level of argon atom is completely filled with electrons (contains 8 electrons).
6. Because the density of petrol is less than that of water so, petrol floats on water surface and water doesn't put out the petrol fires
7. Because each of them is a bad conductor of heat
8. Because there are weak attraction forces among water molecules
9. Due to filling of their outermost energy levels with electrons
10. Because the energy of (K) level is less than that of (L) level
11. Because some molecules of alcohol occupy the intermolecular spaces among water molecules
12. Because it contains protons which are positively charged and neutrons which are electrically neutral

(6) What happen if:

1. Ammonia molecule is formed
2. The petrol floats on water surface, so the fires don't put out.
3. It rusts due to its reaction with atmospheric oxygen
4. Its molecules gain more energy and their speed increases and at the boiling point some of them overcome the intermolecular forces and the intermolecular spaces increase, so they escape in the form of vapour.
5. The colour of ink spreads through all the water

(7) Put (√) or (X) :

1. (X)
2. (√)
3. (√)
4. (X)
5. (X)
6. (√)
7. (X)
8. (X)
9. (X)
10. (X)
11. (X)
12. (X)
13. (√)
14. (√)
15. (√)
16. (X)
17. (X)
18. (√)

(8) Give one difference between each of the following :

1	Neutron	proton
charge	Neutral	Positive
2	**solid**	**Gas**
Intermolecular forces:	Very strong.	Very weak
3	**Ammonia molecule**	**nitrogen molecule.**
no. of atoms	Four atoms.	Two atoms.
4	**Element**	**compound**
Definition	It is the simplest pure form of matter which can't be analyzed chemically into simpler form by simple chemical methods	It is a substance which is formed from combination of atoms of two or more different elements with constant weight ratios
5	**Potassium**	**gold**
Chemical activity :	Active	Inactive
6	**Hydrogen**	**Helium**
No of atoms	2	1

(9) What is meant by ... ?

1. It is anything that has a mass and a volume.
2. It is the amount of energy lost or gained by an electron when it transfers from one energy level to another.
3. It is the atom that gains a quantum of energy.
4. It is the fundamental building unit of matter.
5. The ice begins to change into water at 0°C.
6. The sum of the numbers of protons and neutrons in the nucleus of sodium atom equals 23
7. It is the temperature at which the matter begins to change from the solid state to the liquid state.
8. The mass of one cubic centimeter ($1cm^3$) of water is 1 gm.

(10) Problems:

1

Element symbol	Atomic number	Mass number	Number of protons	Number of electrons	Number of neutrons
$^{14}_{7}N$	7	14	7	7	7
$^{12}_{6}C$	6	12	6	6	6

2

The volume of the iron piece =
The volume of water and the iron piece – The volume of water = 110 – 100 = 10 cm^3.
The density of the iron piece (D)
$= \frac{M}{V} = \frac{78}{10} = 7.8\ gm/cm^3$.

3

The mass of water = the mass of the beaker – the mass of the empty beaker
= 156 – 56 = 100 gm.
The density of water $= \frac{Mass}{Volume} = \frac{100}{100}$
$= 1\ gm/cm^3$.

4

1. $^{40}_{18}Ar$ — K: 2, L: 8, M: 8
2. $^{7}_{3}Li$ — K: 2, L: 1
3. $^{24}_{12}Mg$ — K: 2, L: 8, M: 2
4. $^{19}_{9}F$ — K: 2, L: 7

5

∵ The volume of the piece of iron
= 120 – 100 = 20 cm^3.
∴ The density of iron $= \frac{Mass}{Volume}$
$= \frac{156}{20} = 7.8\ gm/cm^3$.

6

1. $^{23}_{11}Na$ — K: 2, L: 8, M: 1
2. $^{40}_{20}Ca$ — K: 2, L: 8, M: 8, N: 2

7

1. $^{7}_{3}Li$ — K: 2, L: 1
   - The number of electrons in the outermost energy level = 1
   - The number of neutrons = 4
2. $^{24}_{12}Mg$ — K: 2, L: 8, M: 2
   - The number of electrons in the outermost energy level = 2
   - The number of neutrons = 12

8

1. $_{11}Na$ — K: 2, L: 8, M: 1
2. $_{17}Cl$ — K: 2, L: 8, M: 7
3. $_{12}Mg$ — K: 2, L: 8, M: 2
4. $_{3}Li$ — K: 2, L: 1

9

1. 11 2. 23 3. 3 4. 1

10

1. 11 2. 23 3. 11 4. Active.

11

1. $_{19}K$ — K: 2, L: 8, M: 8, N: 1
2. $_{9}F$ — K: 2, L: 7
3. $_{13}Al$ — K: 2, L: 8, M: 3
4. $_{10}Ne$ — K: 2, L: 8

Unit 1

(Matter and its Construction)

Lesson 1 (Matter and its Characteristics)

- **Choose the correct answer :**

1- The density of helium is............................that of air.
a. less than
b. more than
c. equals to

2- The density of petroleum oil is....................that of water.
a. less than
b. more than
c. equal to
d. no correct answer

3- Density measuring unit is ....
a.cm^3.
b. gm.
c. gm./cm^3

4-The property of electric conduction is distinguishing factor between ....
a. iron and copper.
b. wood and plastic.
c. iron and wood.
d. plastic and glass

5- The mass of a piece of rock whose density is 2.8 gm/cm^3 is 28 gm, so the density of 280 gm of it is ....gm/cm^3 .
a.280
b.28
c.2.8
d.28.5

6-Balloons of festivals are filled with ……………………gas.
a.oxygen
b.nitrogen
c.carbon dioxide
d.helium

7-All of the following solutions are electric conductors except………………………..
a.salt
b.alkaline
c.acidic
d.sugary

8-Some substances need heat to become soften such as………………………
a.coal
b.iron
c.sulphur
d.rubber.

9-The smell property is a distinguishing factor between………………………
a. iron and gold
b. wood and plastic
c. perfume and vinegar
d.sugar and salt.

- **Complete the following sentences:**

1-The measuring unit of mass is ……………………., while ……………. is the measuring unit of density.
2-………………..and………………………….are very active metals.
3-……………………is soft at room temperature, while…………………can't be soften.
4-An alloy of ……………………………is used in making jewels, but………………..alloy is used in making heating coils.
5-………………………is from very active metals but…………………………is from inactive metals.
6-In the melting process, solid molecules ………… …………energy and change into ……………state.

7-....................solution is a good conductor of electricity, but....................solution is a bad conductor of electricity.

8-Matter is anything that has..................... and ....

Write the scientific term:

1. A liquid used to keep sodium and potassium metals from air. (................................)
2. The temperature at which a solid substance starts to change into liquid. (................................)
3. Temperature at which liquid state changes into gaseous one. (................................)
4. An alloy which is used in making heating coils. (................................)
5. It is the mass of unit volume of the substance. (................................)

Cross the odd word:

1. Iron - Copper -Aluminium - Wood.
2. Butter - Ice - Iron - Wax.
3. Ice- wood- oil – iron nail.

Correct the underlined words :

1. From substances that float on the surface of water is <u>copper</u>.
2. <u>Gold</u> is from very active metals.
3. <u>Copper-gold</u> alloy is used in making heating coils.

Put (✓) or (×) :

1. Jewels are made up of copper-gold alloy. (   )
2. Wood and copper are bad conductors of electricity. (   )
3. Water is used to put out petrol fires. (   )

Give reason:

1. Manufacturers heat metals to be molten.

....

2. Water isn't put out petrol fires.

....

3. A copper coin sinks in water.

....

4. Wood floats on water surface.

....

5. Iron rods not copper rods are used in building concrete houses.

....

6. Cooking pots are made up of aluminum, while their handles are made up of plastic.

....

7. Sodium and potassium are kept under kerosene surface.

....

8. Equal volumes of different substances have different masses.

....

- **Give an example of:**

1. A substance which is soft at room temperature. ( )
2. A very active metal. ( )
3. A substance that doesn't conduct electricity. ( )
4. An alloy used in making heating coils. ( )
5. A solid substance has low melting points. ( )

- **What will happen if:**

A piece of is left exposed to humid air for a long period of time.

....

- **What is meant by ?**

Density.

....

- **Mention the difference between the following:**

1. Hydrochloric acid solution and a solution of hydrogen chloride in benzene.

....

2. Sodium and gold (concerning: chemical activity).

....

- **Problems:**

1. Calculate the density of a piece of copper, if you know that its mass equals 60 gm, and its volume equals 10 cm^3.

2. Calculate the density of a piece of iron, whose mass 208 gm. and its volume 40 cm^3.

3.When a piece of iron of mass 78 gm. is put in a graduated cylinder containing 100 cm^3 of water, the reading of the cylinder becomes 110 cm^3 .Calculate the density of iron.

4. Liquid (A) has a mass of 27gm and a volume of 30 cm^3, while liquid (B) has a mass of 45 gm. and a volume of 40 cm^3.

1. Find the density of each liquid.
2. If you pour the two liquids into the same container, which liquid will be at the bottom? And why?

Unit 1

(Matter and its Construction)

Lesson 2 (Matter Construction)

- **Choose the correct answer.**

1-The volume of a mixture of 300 cm^3 of water and 200 cm^3 of ethyl alcohol is ....500 cm^3.

a. less than

b. more than

c. equals

d. no correct answer

2-..........................is the monoatomic liquid molecule.

a. Bromine

b. Mercury

c. Iodine

3-Distance among molecules are very small in ....

a. water.

b. copper.

c. hydrogen.

d. oil.

4-From inert gases is ....

a. nitrogen.

b. helium.

c. oxygen.

5-When the temperature of a liquid is raised, its particles.....................

a. escape the attractive forces of the other particles.

b. vibrate more slowly.

c. stop vibrating completely.

6-The molecule of ammonia consists ……………………atoms.

a.2

b.6

c.4

d.1

Complete the following sentences:

1. The liquid element which is composed of one atom is………………………, while that is composed of two atoms is ………………..
2. The matter is composed of small units called……………………, while these units are consisted of smaller units called ……………….
3. Ammonia molecule consists of three ……………atoms and one ……………………..atom.
4. Gases are characterized by large …………………and weak……………………….

Write the scientific term:

1. The basic classification unit of living organisms. (……………….)
2. The smallest part of matter that can exist freely having the properties of matter. (……………….)
3. The matter which doesn't take the shape of the container. (……………….)
4. The result of combination between two or more different elements with constant weight ratios. (……………….)
5. They have definite volumes and indefinite shapes. (……………….)
6. The monoatomic liquid element. (……………….)
7. The force that binds the molecules of matter together. (……………….)
8. The space between molecules. (……………….)
9. The simplest pure form of matter which can't be analyzed simpler. (……………….)

Correct the underlined words :

1. <u>Ammonia</u> molecule consists of two atoms of hydrogen and one atom of oxygen.
2. Aluminum is from <u>liquid</u> elements.
3. <u>Hydrogen</u> is from inert gases.
4. <u>Bromine</u> is the only liquid metal that its molecule consists of one atom.
5. The molecule of a compound consists of <u>similar</u> atoms.
6. Liquids have <u>fixed</u> shapes.
7. The density equals mass divided <u>area.</u>

- **Put (✓) or (×) :**

1. All inert gases are monoatomic. ( )
2. Motion of molecules is limited in liquids. ( )
3. The hydrogen molecule consists of two hydrogen atoms.( )
4. The intermolecular forces are very strong in gases. ( )
5. The motion of gases is completely free. ( )

- **Give reason :**

1. The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.

....

2. Oxygen is an element, while water is a compound.

....

3. It is easy to divide an amount of water into smaller parts.

....

- **What happens when :**

Adding 100 cm^3 of ethyl alcohol to 400 cm^3 of water.

....

- **Define:**

Compound.

....

- **Show by drawing**

The molecules of sodium chloride and ammonia then mention the atoms of the elements forming each one.

- **Mention the difference between the following:**

Oxygen and helium.

- **Compare between:**

1. Solids and liquids (regarding to the intermolecular forces among molecules).

2. Solid and gas (concerning: the motion of the molecules - the attraction forces between molecules).

- **Choose the figure that represents each of the following.**

a. Hydrogen molecule.
b. Water molecule.
c. Helium molecule.
d. Iron molecule.

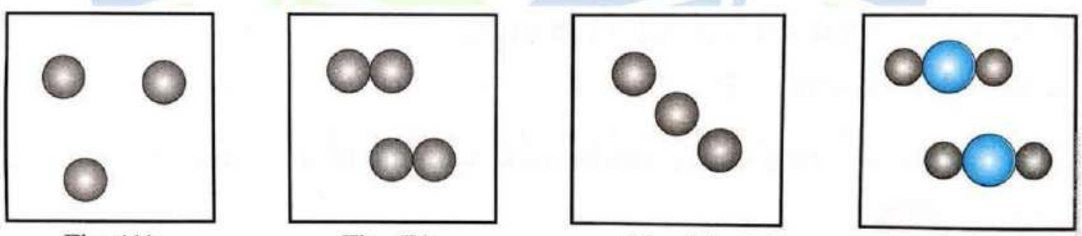


Fig. (A) Fig. (B) Fig. (C) Fig. (D)

1st Preparatory – First Term - Lesson 1 – Part 1 (…. / 15)

1 - Write the definition of each of the following :

1. Density :……………………………………………………………………………………………………
   ………

2 - Write the scientific term for each of the following :

1. Anything that has **a mass** and **a volume** (………………….)
2. The **amount** of **matter** that the body contains (………………….)
3. The **space** that is **occupied** by a substance (………………….)

3 - Complete the following statements :

1. To **determine** the **density** of a body you must know……………..and…………
2. You can **distinguish** between **gold** and **silver** by their different……………………….
3. The **measuring unit** of **mass** is…….., while the **measuring unit** of **volume** is………
4. **A physical quantity** which is equal to the **multiplying** the **density** of an object by its **volume** is………………….

4 - Give reason for each of the following :

1. Colour, taste and odour can't be used to differentiate between water and oxygen?...
   ………

5 – Choose the correct answer :

1. The **density** of **a substance** is a…………………**property**
   a. chemical
   b. physical
   c. biological
   d. (a) and (b)

2. **Density** of **red copper** is 8.8 **gm/cm³** means…………………..
   a. the mass of the volume unit of red copper equals 8.8 gm
   b. the mass of the volume unit of red copper doesn't equal 8.8 gm
   c. the mass of 10 cm³ of red copper equals 8.8 gm
   d. the mass of the volume unit of red copper equals 0.8 gm

6 – Choose the odd word out – write the scientific term :

1. Density/ Mass / Force / Volume (............................)
   The scientific term for others :..

7 – Problems :

1. Complete the following table :

Substance	**Mass** (gm)	**Volume** (cm^3)	**Density** (gm/cm^3)
A	22	....	2
B	5	20	....
C	....	15	1

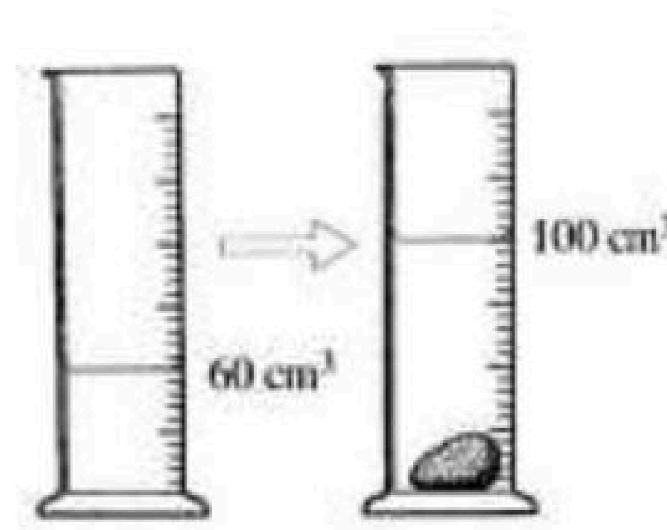
2. In **an experiment** for **determining** the **density** of **a liquid**, the **following results** were **recorded**
   - The **mass** of the **empty cylinder** = 75 **gm**
   - The **mass** of the **cylinder** containing the **liquid** = 135 **gm**
   - The **volume** of the **liquid** = 100 **cm^3**

Find the **density** of the **liquid**

....

....

3. **Find** the **density** of this stone if its **mass** = 80 **gm**?
   ....
   ....
   ....



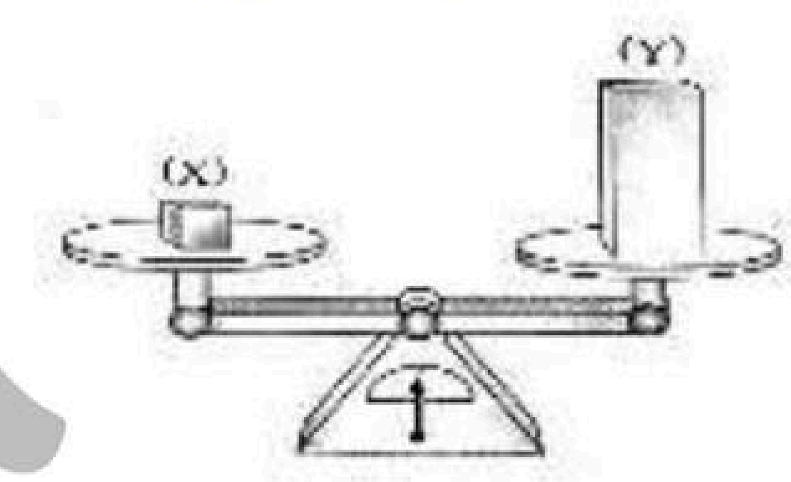
4. ***Two*** balls of the **same metal**, the **volume** of the **first ball** is 10 **cm^3** and that of the **second ball** is 20 **cm^3**, if the **mass** of the **first ball** is 78 **gm**. **Calculate** the **mass** of the **second ball**
   ....
   ....

THANK YOU

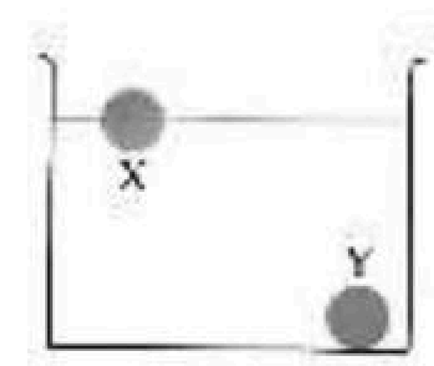
1st Preparatory – First Term - Lesson 1 – Part 2 (…. / 15)

1 – Choose the correct answer :

1. The ***density*** of 10 **cm³** of **water** is……………..the ***density*** of 200 **cm³** of it
   a. more than
   b. less than
   c. equal to
   d. double
2. In the opposite figure : The two objects (X) and (Y) have the **same**………….



   a. volume and density
   b. mass and volume
   c. mass and density
   d. mass and they are from different substances
3. In the opposite figure, if the **volume** of the **two balls** (X) and (Y) is **equal**, so the **mass** of the ball (X) is…………the **mass** of the ball (Y)



   a. less than
   b. equal to
   c. more then
   d. double

2 - Complete the following statements :

1. **Same**………………….of **different** substances have **different**…………………..
2. ………..gas is used in **filling balloons** during **festivals** as its density is………….than that of air

3 - Give reason for each of the following :

1. An iron nail sinks in water, while 1 kilogram of cork floats on its surface?……………..
…………………………………………………………………………………………………

4 - What happens when :

1. Cutting a cube of wood into two halves? (concerning its density)…………………………
…………………………………………………………………………………………………
2. Oil is mixed with water?……………………………………………………………………
…………………………………………………………………………………………………
3. Using water to extinguish petrol fires?………………………………………………………
…………………………………………………………………………………………………

5 – Answer the following question :

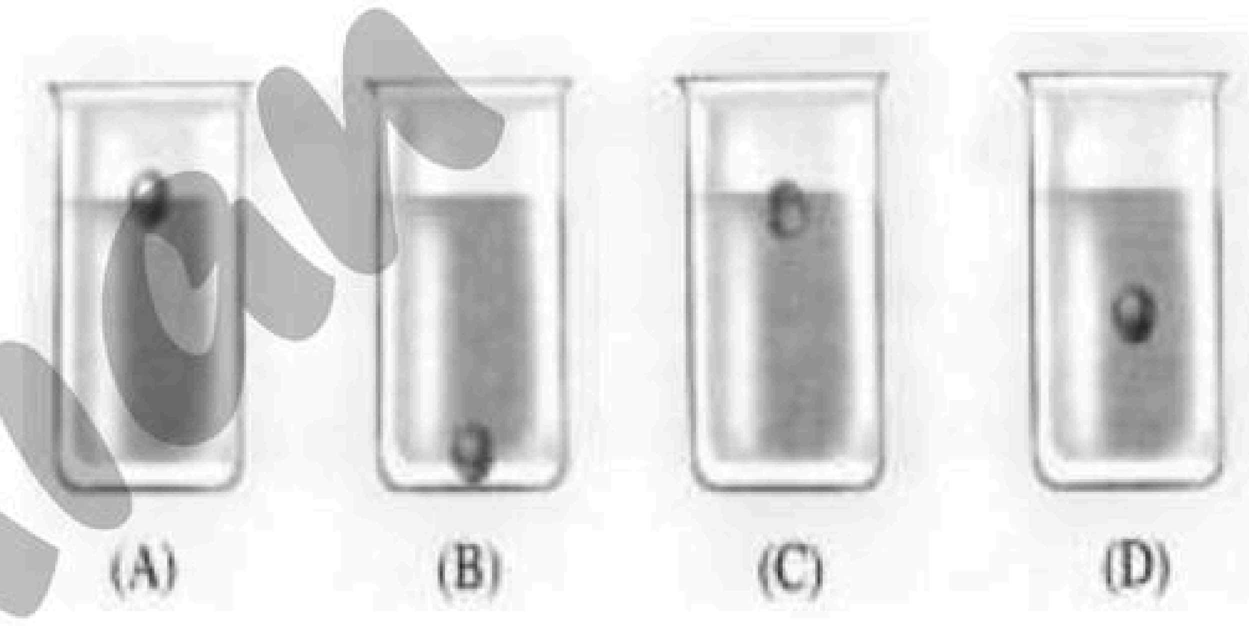
1. ***Arrange*** the following objects ***descendingly*** according to the ***space*** that is occupied by the **body** (***volume***). **Explain** your answer

(**One** ton of **iron** – **One** ton of **wood** – **One** ton of **cork**)

....

6 – Study the opposite figures, then answer :

The following figures represent ***four balls*** which are **similar** in volume, mass and type. They are put in four beakers containing **different liquids**. following :



1. **Arrange** the four liquids in **ascending order** according to their densities

   ....

   ....

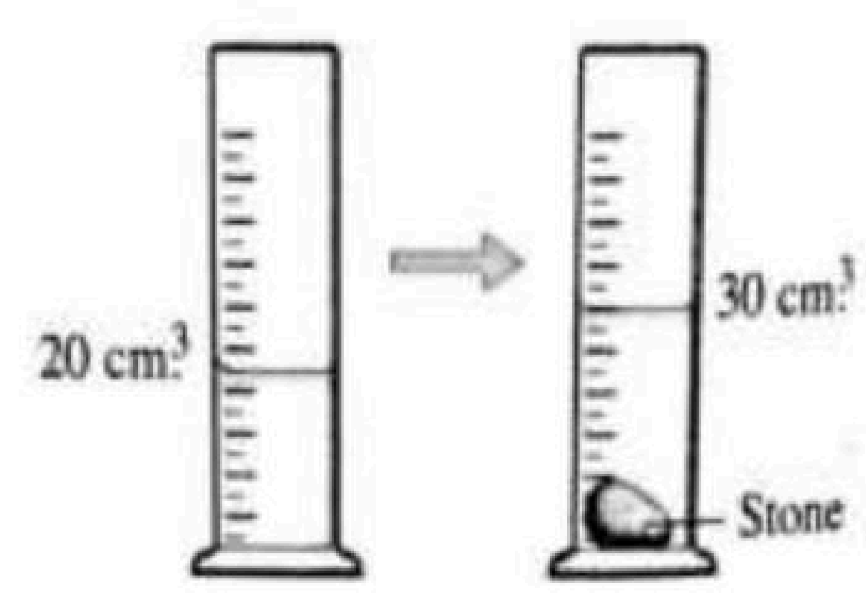
2. In which figure the **density** of the **ball** is :
   a. **Greater than** that of the **liquid** (.....................)
   b. **Less than** that of the **liquid** (.....................)
   c. **Equal to** that of the **liquid** (.....................)

7 – Problems :

1. **A cube** of **wood**, whose ***length*** of ***side*** is 2 **cm** and its **mass** is 6 **gm**.
   a. **Calculate** its **density**
   b. Does the cube **sink** in **water** or **float** on **its surface**? (Give reason)

(Knowing that the **density** of **water** is 1 **gm/cm³**)

From the opposite figure :



a. **Calculate** the **volume** of the **piece** of **stone**
b. If the **mass** of the **stone** = 80 **gm**. What is the **density** of this **stone**?
c. If the stone is placed in **a jar** containing **mercury**. Does it ***sink*** or ***float***? **Give reason**

(Knowing that the ***density*** of ***mercury*** is 13.6 ***gm/cm³***)

THANK YOU

1st Preparatory – First Term - Lesson 1 – Part 3 (…. / 15)

1 - Write the definition of each of the following :

1. Melting point :……………………………………………………………………………………………
   ………

2 – What is meant by each of the following :

1. The melting point of iron is 1535°C?………………………………………………………………
   ………

3 - Complete the following statements :

1. …………….is **soft** in room temperature, while…………………..**becomes soft** by **heating**
2. **An alloy** of……………………..is used in **making jewels**, while **an alloy** of………………is used in making **heating coils**
3. **Table salt** is from the solid substances that have……………….melting point
4. **Stainless steel** is used in making……………….as it has high……………point
5. Some **solutions** are **good** conductors of electricity as………………….and…………………., while **others** are **bad** conductors of electricity as……………….and……………………
6. Electric screwdrivers are **made up** of…………………, while their **handles** are made up of…………………..or……………………

4 - Give reason for each of the following :

1. It's easy to form metals (copper), while it's difficult to form sulphur or coal?…………
   ………
2. Iron rods not copper rods are used in building concrete houses?…………………………
   ………
3. Cooking pans are made of aluminium, whereas their handles are made of wood?…..
   ………

5 – Choose the correct answer :

1. **A solid substance**, its **melting point** is 1500**°C**, **starts** to **change** into **liquid** at..
   a. 1000°C b. 1500 °C c. 1550 °C

2. **Separation** of **petroleum oil** components depends on the **difference** in their.....

   a. melting points b. densities c. boiling points

3. The property of **electric conduction** is **a distinguishing factor** between..........

   a. iron and copper
   b. iron and wood
   c. wood and plastic
   d. no correct answer

4. ***Metals*** are characterized by their...................................

   a. conductivity of electricity
   b. conductivity of heat
   c. high melting point
   d. all the pervious answers

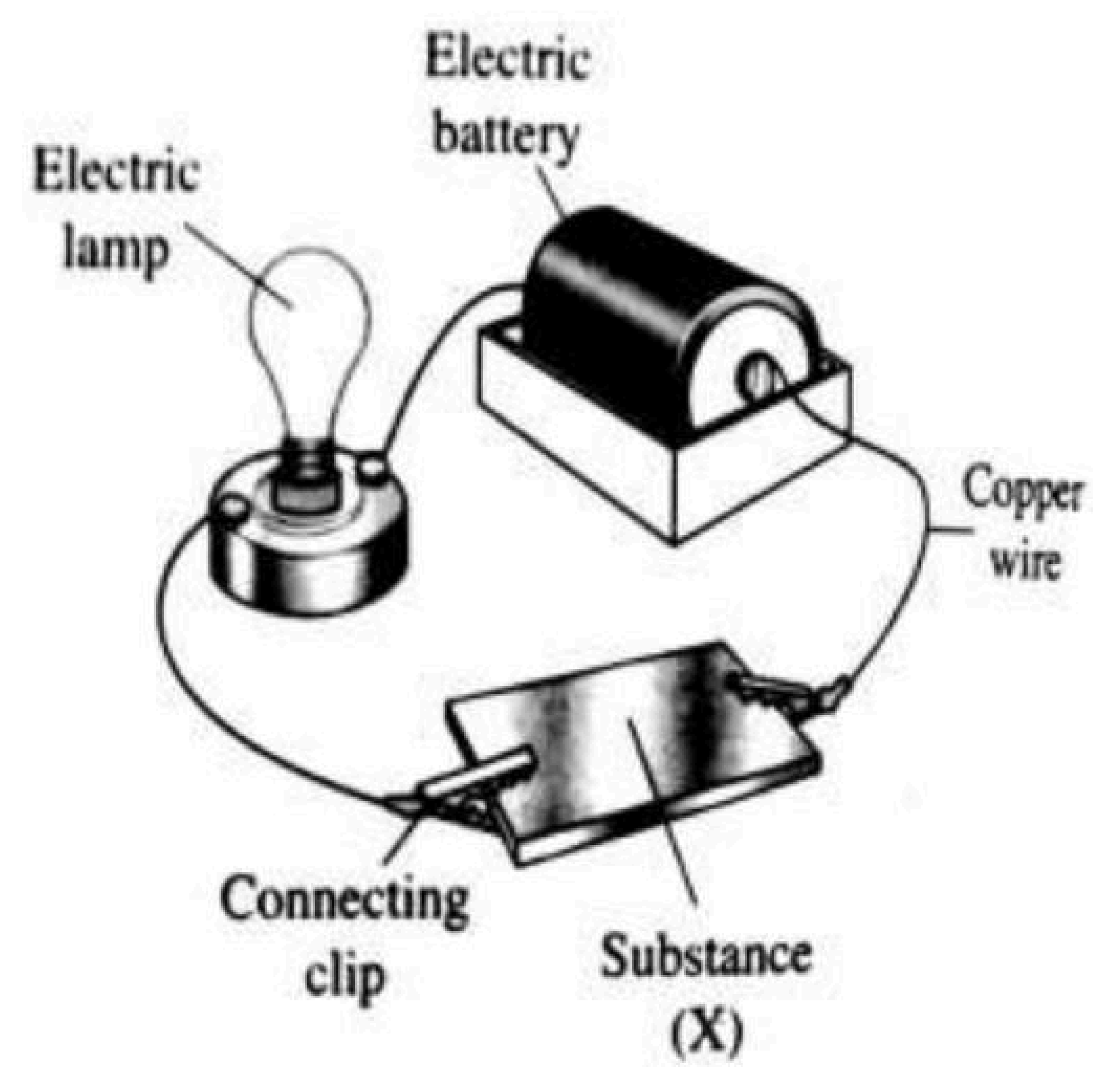
6 – Choose the odd word out – write the scientific term :

1. Wax / Aluminium / Butter / Ice (............................)

   The scientific term for others :..

7 – Study the opposite figure, then answer :

From the opposite figure, **answer** the following questions :



1. What do you **conclude** from the **illumination** of the **electric lamp**?

   ....

   ....

2. **What happens for** the **illumination** of the **lamp** in the **following cases**. **Why**?

   a. **Connect** the **connecting clips** to the ends of **a piece** of **wood** instead of **substance** (X)

      ....

      ....

      ....

   b. **Immerse** (**dip**) the connecting clips in **dil.hydrochloric acid solution**

      ....

      ....

      ....

THANK YOU

1st Preparatory – First Term - Lesson 1 – Part 4 (…. / 20)

1 – Compare between each of the following :

1. **Very active** metals, **less active** metals and **inactive** metals

P.O.C	Very active metals	Less active metals	Inactive metals
Reaction with oxygen	…………………………… …………………………… …………………………… …………………………… …………………………… ……………………………	…………………………… …………………………… …………………………… …………………………… …………………………… ……………………………	…………………………… …………………………… …………………………… …………………………… …………………………… ……………………………
Examples	…………………………… ……………………………	…………………………… ……………………………	…………………………… ……………………………

2 – Write the scientific term for each of the following :

1. The **liquid** used to **preserve (save)** the **very active metals** as **sodium** (…………….)
2. The **substance** that is used to **cover** the **metallic spare parts** of **cars** (…………….)

3 - Complete the following statements :

1. **Light spots** in **streets** are **painted** from time to time to protect them from…………
2. ……………,………….and **gold** are………….**metals**, so they are used in **making jewels**

4 - Give reason for each of the following :

1. Sodium and potassium are kept under kerosene surface?……………………………………… ………………………………………………………………………………………………
2. Cooking pans made up of aluminium are washed with a rough material?…………….. ………………………………………………………………………………………………

5 – Choose the odd word out – write the scientific term :

1. Silver / Chromium / Potassium / Platinum (……………………….)
   The scientific term for others :……………………………………

6 – Choose the correct answer :

1. ………..is (are) from the metals that react with air **if** they **left** in **air** some days
   a. Copper b. Sodium c. Silver
2. The **metal** that is used to **plate** (**cover**) other substances is………………………………
   a. silver b. copper c. lead

7 – What is the importance of each of the following :

1. Platinum :………………………………………………………………………………………
   ……………………………………………………………………………………………………
2. Nickel :…………………………………………………………………………………………
   ……………………………………………………………………………………………………

8 – Study the opposite figure, then answer :

Three **metallic elements** (X, Y , Z) react with oxygen by varying degrees as follows :

- **(X)** Finds **great difficulty** in reacting with oxygen
- **(Y)** reacts **instantly** (**immediately**)
- **(Z)** reacts **after few days**

Answer the following questions :

1. **Arrange** the previous metallic elements **descendingly** according to the **degree** of **chemical activity**
   ……………………………………………………………………………………………………
   ……………………………………………………………………………………………………
2. **Mention** 2 **examples** of element (Y)
   ……………………………………………………………………………………………………
   ……………………………………………………………………………………………………
3. Which of the previous metals can be used in:
   a. Making **cooking pans**? (…………………)
   b. **Painting** the **steel bridges** and the **holders** of the **light bulbs**? (…………………)

THANK YOU

1st Preparatory – First Term - Lesson 2 – Part 1 (…. / 20)

1 - Write the definition of each of the following :

1. Molecule :………………………………………………………………………………………
………………………………………………………………………………………………

2 - Write the scientific term for each of the following :

1. The **state** of **matter** that has **a definite** shape and **a definite** volume (………..)
2. The **state** of **matter** that has **a definite** volume and **an indefinite** shape (………..)
3. The **state** of **matter** that has **an indefinite** shape and **volume** (………..)

3 - Complete the following statements :

1. The **spaces** that are found **among** the **molecules** of **matter** are called…………….
2. The **molecules** are **bonded** together by……………………
3. The **state** of **matter** depends on……………………and…………………between **molecules**
4. The **intermolecular spaces** among the molecules of **metals** are……………………and the **intermolecular forces** among their molecules are……………………
5. The **motion** of solids is……………, while it is…………..in liquids and in gases is……….
6. ……………..**take** the **shape** of the container, while……………..has **no definite** shape

4 - What happens when – Why :

1. Putting some potassium permanganate in water?…………………………………………
………………………………………………………………………………………………
2. Add 50 cm^3 of ethyl alcohol to 100 cm^3 of water?………………………………………
………………………………………………………………………………………………
3. Try to break an iron piece with your hand?……………………………………………
………………………………………………………………………………………………

5 - Put (√) or (x) then correct the false statement :

1. The intermolecular forces among the gaseous molecules are **vanished** (……….)
2. The intermolecular distances among the molecules of gases are **limited** (……….)

6 – Choose the correct answer :

1. The **properties** of................of **water** are the **same properties** of 100 **ml** of **it**
   a. an atom
   b. a molecule
   c. an ion
   d. an element
2. The **velocity** of **gaseous** molecules is........................
   a. very slow
   b. medium
   c. very fast
   d. definite
3. The **attraction force** between **water** molecules is.......that between **water vapour** molecules
   a. more than
   b. less than
   c. equal to
   d. double

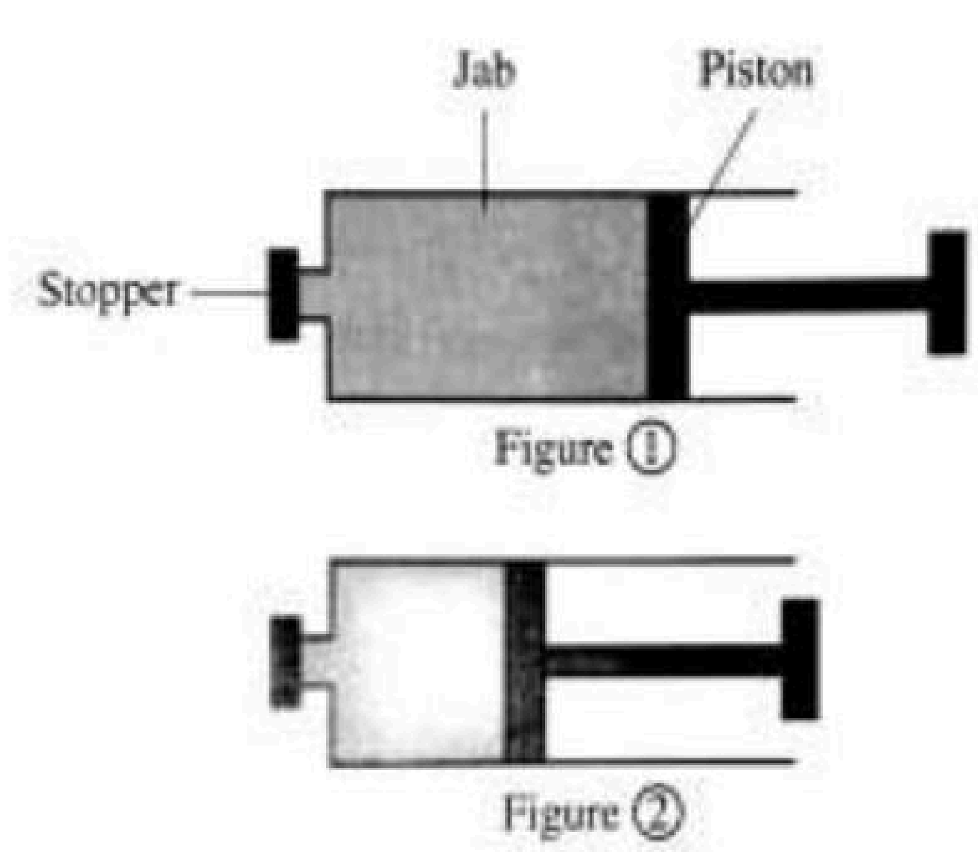
7 – Complete the following table using the following words :

Wide – Narrow – Limited – more free – Vanished - Unlimited – Relatively large – Very strong – Relatively weak

P.O.C	Solid state	Liquid state	Gaseous state
Intermolecular spaces	....	....	....
Intermolecular forces	....	....	....
Motion of molecules	....	....	....

8 – Study the opposite figure, then answer :

1. **Figure (1)** shows **a jab** filled with **a substance** and it is **closed** from **its top** and **figure (2)** shows the **same jab** after pressing it
   - What is the **state** of the **substance** inside it? **(Give reason)**



....

....

THANK YOU

1st Preparatory – First Term - Lesson 2 – Part 2 (.... / 20)

1 - Write the definition of each of the following :

1. Melting :..
   ....
2. Vaporization :...
   ....

2 - Complete the following statements :

1. On heating **a solid material,** this leads to the increase in the.............of molecules, so the................................among them increases
2. During **vaporization**, **liquid molecules**.............**energy** and change into............... **molecules**

3 - Give reason for each of the following :

1. The change of matter from solid state to liquid state by heating?...............................
   ....
   ....
2. The change of matter from liquid state into gaseous state by heating?......................
   ....
   ....

4 - What happens when :

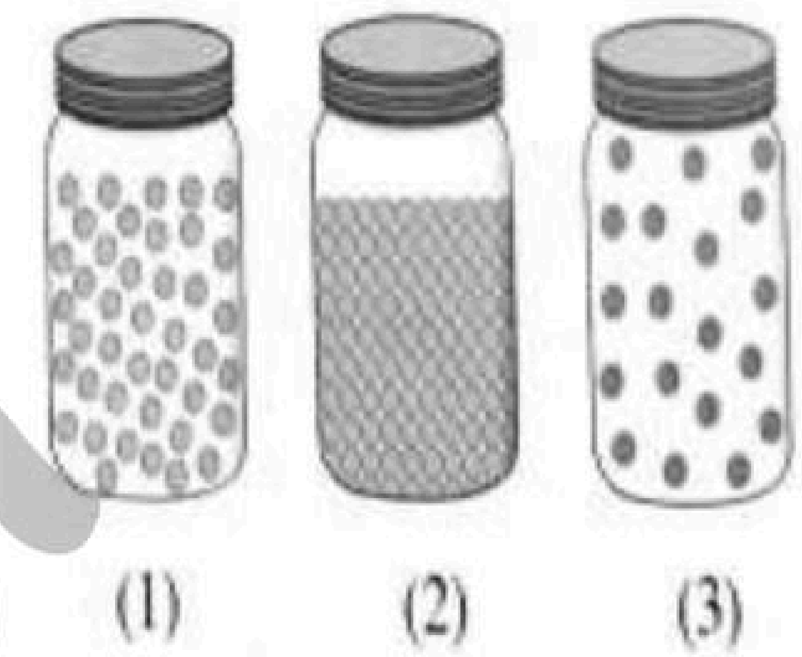
1. A substance reaches its melting point?...
   ....
2. A substance reaches its boiling point?...
   ....

5 - Put (√) or (x) then correct the false statement :

1. During melting process, the solid molecules **lose** energy (..........)
2. When water **boils**, the intermolecular forces increases and the intermolecular spaces decrease (..........)
3. The **molecules** of **water** are **more coherent** than the **molecules** of **air** (..........)

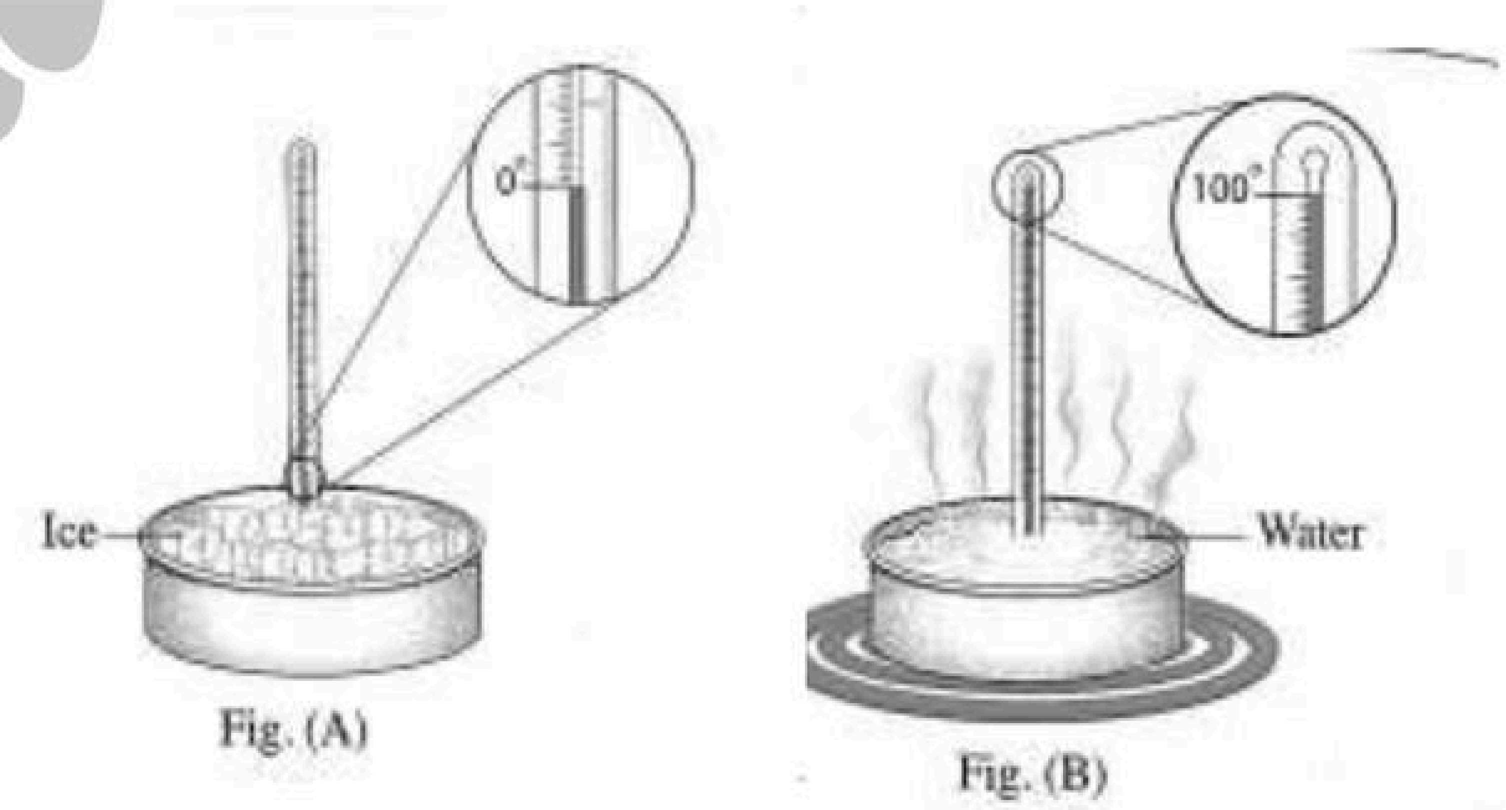
6 – Choose the correct answer :

1. The **melting** process **reverses** the……………..process
   a. freezing c. condensation
   b. vaporization d. boiling
2. The **vaporization** process **reverses** the……………..process
   a. freezing c. condensation
   b. melting d. boiling
3. Figure………is the state of matter that its molecules **spread** in **any available space**
   a. 1
   b. 2
   c. 3



7 – Study the opposite figure, then answer :

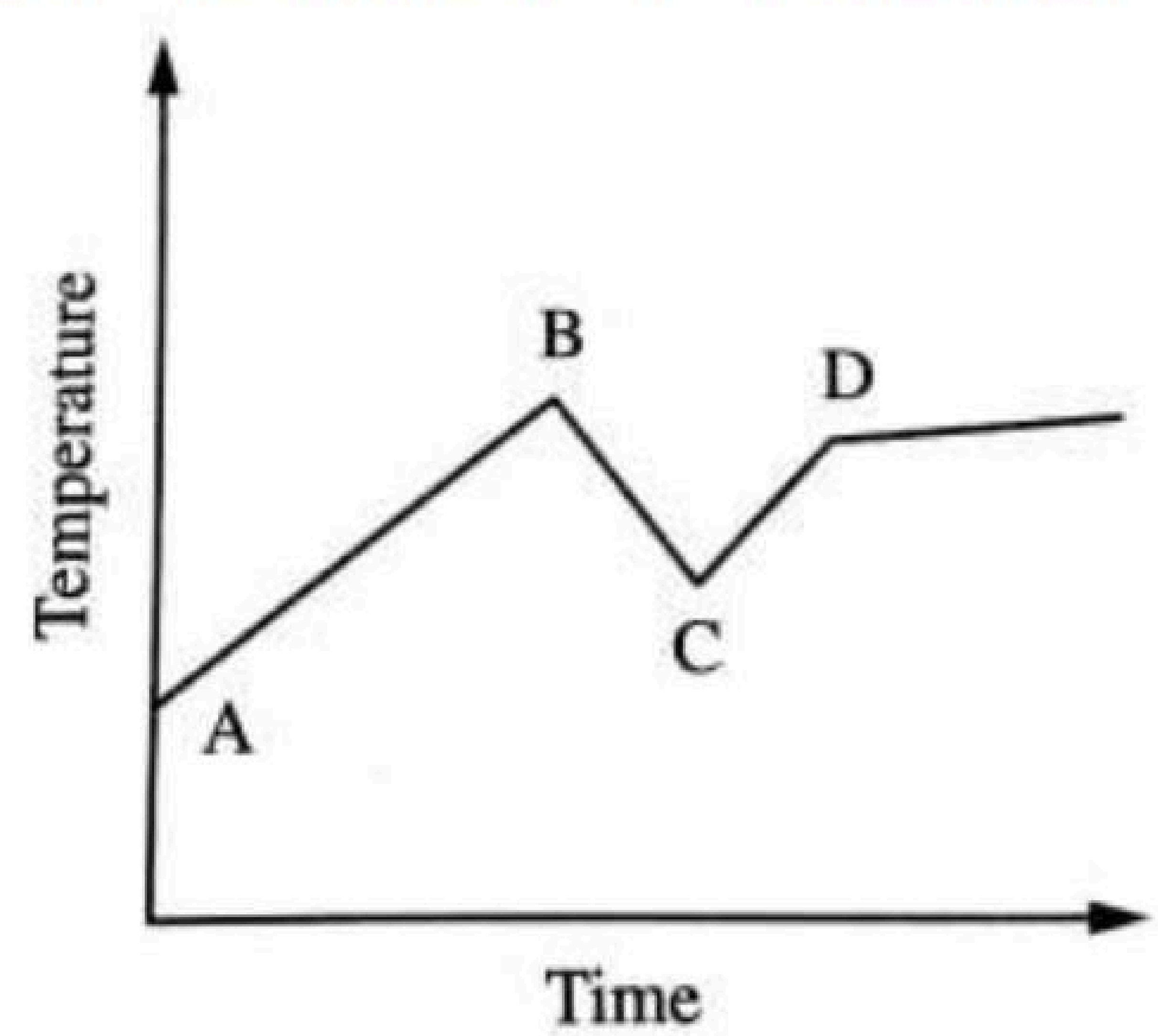
1. Which of the following figures **indicates**?
   a. **Melting** process
   b. **Vaporization** process



Give reason for your answer?

……………………………………………………………………
………
………

2. **Salma** heated **a beaker** of **water**, at **one point** of the **experiment**, she added some **ice cubes** in the **beaker** of **water**
   - **At which point** in the **graph** were the **ice cubes** added to the **beaker** of **water?**
   a. A c. C
   b. B d. D



THANK YOU

1st Preparatory – First Term - Lesson 2 – Part 3 (…. / 25)

1 - Write the definition of each of the following :

1. Element :……………………………………………………………………………………………
   ……………………………………………………………………………………………………
2. Compound :……………………………………………………………………………………………
   ……………………………………………………………………………………………………

2 – Write the scientific term of each of the following :

1. The **molecule** which is formed of **similar** atoms (……………….)
2. The **molecule** which is formed of **different** atoms (……………….)
3. The **gases** in which the **molecule** consists of **one** atom (……………….)
4. The **gases** in which the **molecule** consists of **two** atoms (……………….)

3 - Complete the following statements :

1. **Matter** consists of **small building units** called…………….which consist of **smaller building units** called…………….
2. **Molecules** of **one** (**same**) **substance** are……….in properties, but they…………from **other** substance molecules
3. The **monoatomic liquid element** is………., while the **diatomic liquid** one is……..
4. **Chlorine** molecule consists of…….atoms, while **xenon** molecule consists of…atom
5. **Hydrogen chloride** molecule consists of….**hydrogen atom** and….**chlorine atom**
6. The **ratio** of the **number** of **atoms** between **water** and **ammonia** molecules is……

4 - Give reason for each of the following :

1. Molecules of various (different) substances are different from each other?…………….
   ……………………………………………………………………………………………………
2. Molecules of mercury and bromine are different although both of them are liquid?.
   ……………………………………………………………………………………………………
3. Water is a compound molecule?……………………………………………………………
   ……………………………………………………………………………………………………
4. Oxygen is an element molecule, while hydrogen chloride is a compound molecule?
   ……………………………………………………………………………………………………

5 - Put (√) or (x) then correct the false statement :

1. **Krypton** molecule is a gaseous diatomic molecule (..........)
2. The compound consists of combination of atoms of one element (..........)
3. **Hydrogen chloride** consists of number of atoms **equal** that of elements (.........)

6 – Choose the correct answer :

1. All the following are **molecules** of **elements**, **except**..................



2. The figure number..................represents **fluorine** molecules

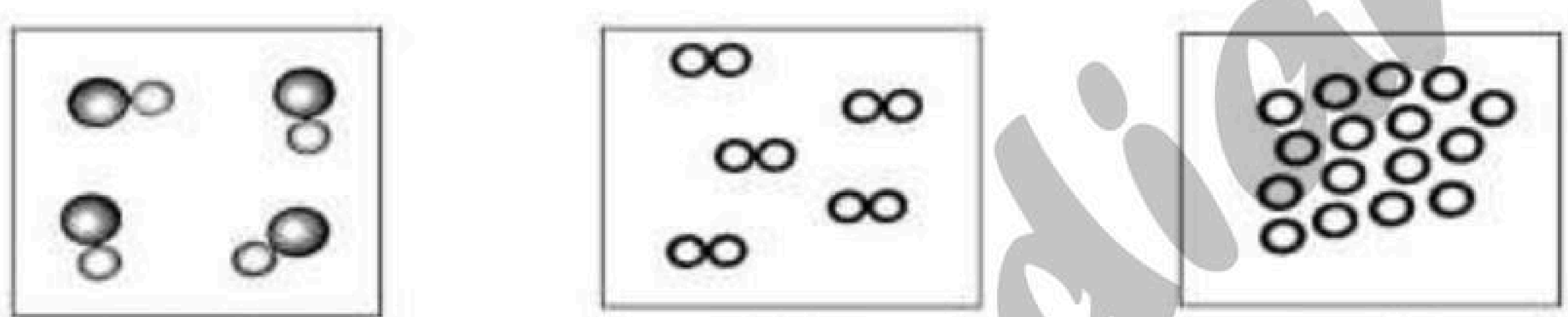


Fig. (A) Fig. (B) Fig. (C)

3. The **model** that represents **hydrogen chloride** molecule is.....................



4. The **number** of **elements** is **half** to the **number** of **atoms** in.................**molecule**

a. water b. ammonia c. hydrogen chloride

7 – Choose the odd word then write the scientific term :

1. Neon – Argon – Xenon - Hydrogen (................)
   The scientific term for others :..
2. Water – Aluminium – Magnesium – Fluorine (................)
   The scientific term for others :..

8 – Compare between each of the following :

P.O.C	O_2	2O
Structure	....	....

THANK YOU

Evaluation on Lesson 1

Q1 **Complete the following statement:**

1.Unit of volume is ……………and that of mass is ……………

2.You can differentiate between table salt and sugar by their different ……………….

3.An alloy of …………..is used in making jewels while an alloy of …………is used in making heaters coils .

4.Substancesdiffer in some of their characteristics such as …..........….., …………… and ………………………

5.Some solutions are good conductor of electricity such as …………and …………, while some solutions which do not conduct electricity like …………….

6.Equal masses of different substances have different ……………………………….

7.Bridges are made up of iron and coated in the purposes of protecting them from…………………

8. Electric wires are made up of …………….or …………….

9. Substances of densities less than the water density …………….on water surface, while other substances of densities more than that of water ……………………

10. Some solids are soft at ordinary temperature such as ………………………..

11……………..and……………….are good conductors of electricity while ………

and………………are bad conductors of heat.

12. Balloons filled with ……………… or …………………. rise up in air .

13.Active metals lose their………………..when they are exposed to…………….air.

14.…………….and………………..are very active metals, while……………..

and…………are inactive ones.

15.A piece of lead of mass 14 gm and occupies 10 cm^3 will……………..in water.

Q2 **Write the scientific term:**

1 – Mass of unit volume of a substance. (……………………….)

2 – The temperature at which a substance changes from solid state into liquid state. (……………………….)

3 – The temperature at which a substance changes from liquid state into gaseous state. (……………………….)

4 – Metals react with atmospheric air after long time. (……………………….)

Q3 **Give reasons for:**

1 – Painting metallic bridges and light columns in streets from time to time.

……………………………………………………………………………………

2 – Gold and silver are used in making jewels.

……………………………………………………………………………………

3 – Cork floats on the water surface while the iron nail sinks.

……………………………………………………………………………………

4 – Cooking pots are made up of aluminum where their hand is made up wood.

……………………………………………………………………………………

5 – Water doesn't use in putting off petroleum fire.

……………………………………………………………………………………

6 – Equal masses of different substances have different volumes

……………………………………………………………………………………

Q4 **Choose the correct answer**

1.The volume of water in cm^3 is always …………its mass in grams .
(Knowing that the density of water is 1 gm/cm^3).

(double – less than – more than – equal to)

2.The following cubes have the same mass. Which one has the largest density?



3.………………does not melt by heating.

(rubber – coal – aluminium – silver)

4.The mass of a piece of rock its density is 2.8 gm/cm^3 is 28 gm, so the density of 280 gm of it is …………………

(280 – 28 – 2.8 - 2800)

Q5 Answer the following

1. A piece of metal has a mass of 189 gram, volume of $3cm^3$. Calculate its density.

………………………………………………………………………………………………

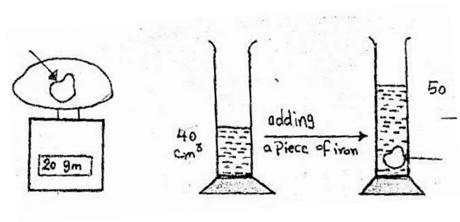
2. A cube of a certain material has aside length = 10 cm. Calculate its density when its mass equal to 99 gm.

………………………………………………………………………………………………

3. In an experiment for determination the density, the mass of the used beaker (empty) was 25 gm., the mass of the beaker (containing liquid) was 75 gm, Calculate the density of the liquid if its volume is 50 cm^3.

………………………………………………………………………………………………

4.From the opposite figure:



A. Calculate the volume of stone.

……………………………………………………………………………

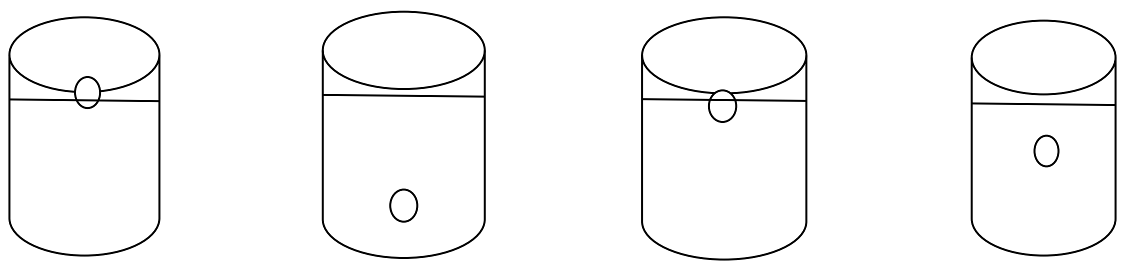
B. If the mass of stone = 20 gm what's the density of this stone?

………………………………………………………………………………

C. If this stone is placed in a jar containing mercury does it sink or float? Give reason (density of mercury is 13 gm / cm^3)

………………………………………………………………………………

5-The following figures represents four balls which are similar in volume, mass and -type. They are put in four beakers containing different liquids. Answer the following questions:



(A) **(B)** **(C)** **(D)**

A-Arrange the four liquids in an ascending order according to their densities.

………………………………………………………………………………………………

B-In which figure the density of ball is

1-Greater than that of a liquid. **2-**Less than that of the liquid. **3-**Equal to that of the liquid.

Evaluation on Lesson 2

Q1 Complete the following statement

1- Matter consists of ....that carry its properties.

2- Ammonia molecule consists of three ....atoms and one ....atom.

3- Molecules consist of very tiny structure units known as ....which cannot be seen by naked eyes.

4- Helium is considered from.................and its molecule is composed of........... atom(s).

5- Intermolecular force in iron is ....than that in petroleum oil.

6- ....is a liquid element that consist of two atoms.

7- Inert gases consist of ....atom like ....,..........and ....

8- ....and .... are solids that consist of one atom.

9- Hydrogen chloride consists of............atom(s) and............element(s).

10-Water molecule consist of one ....atom and two ....atoms

11. During vaporization , liquid molecules ....energy and change into.........state

Q2 Answer the following

- Determine the no. of atoms and elements in each of the following:

Molecules	No. of atom(s)	No. of elements(s)
Carbon dioxide		
Ammonia		
Water		
Sodium chloride		
Oxygen		

Q3 Write the scientific term

1-The smallest part in matter that can exist freely having the properties of matter. (……………………..)

2 - The simplest form of matter which cannot be decomposed into a simpler on. (……………………..)

3 - A Liquid element whose molecule consists of two atoms. (……………………..)

4 - Gaseous elements consist of only one atom. (……………………..)

5 - A Type of matter keeps its shape & volume whatever the container's shape changed. (……………………..)

6 - Tiny structure units forming the molecule. (……………………..)

7 - The elements that their molecules contain two atoms. (……………………..)

8 - A Liquid element whose molecule consists of one atom. (……………………..)

Q4 Give reasons for :

1-water and alcohol is less than the sum of their volumes before mixing.

…………………………………………………………………………………………………

2-It is different to break down a piece of iron with your hand.

…………………………………………………………………………………………………

3-Oxygen is an element while sodium chloride is a compound.

…………………………………………………………………………………………………

4-Molecule of helium differs from molecule of hydrogen.

…………………………………………………………………………………………………

5-The color of water change on adding an amount of potassium permanganate to it.

…………………………………………………………………………………………………

6- The Liquids take the shape of their containers.

…………………………………………………………………………………………………

Q5 What happens if :

1-Two Hydrogen atoms combine with one Oxygen atom.

………………………………………………………………………………………………

2- Milk is put in a triangular container.

………………………………………………………………………………………………

Q6 Complete the table

P.O.C	Solid	Liquid	Gas
I.M.F			
I.M.S			
Shape			
Volume			
Motion			

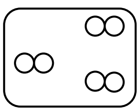
Q7 Choose the correct figure

1-Hydrogen molecules

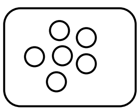
2-Water molecules

3-Iron molecules

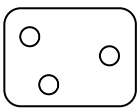
4-Helium molecules



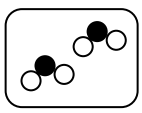
(a)



(b)



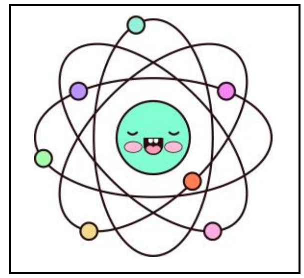
(c)



(d)

Science Department

Revision Sheets For 1st prep.
Unit 1 (Lesson 1 and 2)



1-Write the scientific term:

1-Mass of unit volume of substance.

2-It's the temp at which substance changes from solid state into a liquid one.

3-It's the temp at which substance changes from liquid state into a gas on

4-An alloy used in making cooking pots.

5-Alloy used in making heating coils.

6- Liquid monatomic element.

7- Gaseous monatomic elements.

8- States of matter that take the shape of the container.

9- States of matter that have definite volume.

10- The simplest pure form of matter.

11- Molecule contains more than one type of atoms.

12- the result of combination between two or more atoms of different elements with constant weight ratios

13- the smallest part of matter that can exist freely ,having the properties of matter.

14- the smallest particle which can share in chemical reactions.

15- a molecule is formed of two hydrogen atoms and one oxygen atom.



Complete:

1. Matter is anything that has ------------------- and ------------------

2. The measuring unit of mass is -----------,while ---------- is the measuring unit of the volume.

3. ----------& ---------float on the water as they have -------- density than that of water, while --------------, ------------- sink in water.

4. We distinguish between gold and silver by their different ------------

5. We differentiate between table salt and sugar by their different -----

6. We differentiate between perfume and vinegar by their different ----

7. Density is the mass of --------------------------------

8. Golden jewels are made of -------------------------------- alloy, while the heating coils are made up of ---------------------------- alloy.

9. The measuring unit of density is ---------------------------

10. Equal volumes of different substances have different -------------- because they have different densities.

11. Melting point is -------------------------- at which substances change from solid state to --------------------------- state.

12. There are materials don’t soften by heating such as ------------------

13. Electric insulators are made up of materials such as ----------- and ------------

14. There are good conductors of electricity and heat such as ----------- and ----------- while there are bad conductors of electricity and heat such as --------- and ------

15. Active metals lose their ------------------- when they are exposed to moist air.

16. Gases are ---------------------------- conductors of electricity.

17. Acidic solution is ------------------------ conductor of electricity.

18.steel bridges are painted to protect them from……….,…………….

19-a piece of metal , whose mass is 25gm and its volume is $10cm^3$.when it is placed in water , it will……………….(water density is $1gm/cm^3$)

20-the density 0f 10 cm^3 of water is…………the density of $200cm^3$of water.

21-During vaporization process, liquid molecules …………….energy and changes into………………….molecules.

22-the attraction force between molecules of …………..is very strong and almost not exist in……………….

23-…………….take the shape of container , while …………………….have no definite shape.

24- hydrogen molecule is composed of………….atom(s) , while argon molecule is composed of……………….….atom(s).

25-the liquid element which consists of one atom is……………..., while that consists of two atoms is………………

Give reasons for:

1.Iron sinks in water while wood floats on water.

………………………………………………………………………………

2. Equal volumes of different substances have different masses.

…..

3.Water is not to put out petrol fires.

…...

4.Balloons filled with hydrogen and helium rise up.

…...

5.Electric wires are made of copper or aluminium.

…..

6.Screwdrivers are made of steel, while their handles are made of plastics.

…...

7.Cooking pans are made of aluminium.

…..

8.Handles of cooking pans are made of wood or plastic.

…..

9.Sodium and potassium are kept under kerosene surface.

…...

10.Steel bridges and the holder of light bulbs are painted.

……..

11.Washing of cooking pans with rough materials.

…...

12.Silver and gold are used in making jewels.

…..

13.The odour of perfume spreads all over the room when the bottle is opened.
……………………………………………………………………………………………
14.A drop of ink spreads in water.
……………………………………………………………………………………………
15.It is difficult to break down a piece of iron with your hand.
……………………………………………………………………………………………
16.Gases have indefinite shapes and volumes.
……………………………………………………………………………………………
17.The change of matter by heating from the solid state to the liquid state.
……………………………………………………………………………………
18. Oxygen is an element, while sodium chloride is a compound.
………………………………………………………………………………………………

Give one example for each of the following:

1-A liquid element composed of one atom.
2-A liquid element composed of two atoms.
3-An active gas.
4-A Nobel gas.
5-A compound molecule consists of three atoms.

Problems:

1-What is the density of the oil, if 80 gm of oil occupies 100 cm3?

……………………………………………………………………………………………

2-Calculate the mass of 1000 cm3 of milk knowing that its density is 1.03 gm/cm3?

....

3-Calculate the volume of 500 gm of iron if its density is 7.8 gm/cm3?

……………………………………………………………………………………………

4-A piece of iron is put in a beaker contains 100 cm3 of water the volume becomes 150 cm3 if the mass of this piece is 390 gm, Calculate the density if the iron?

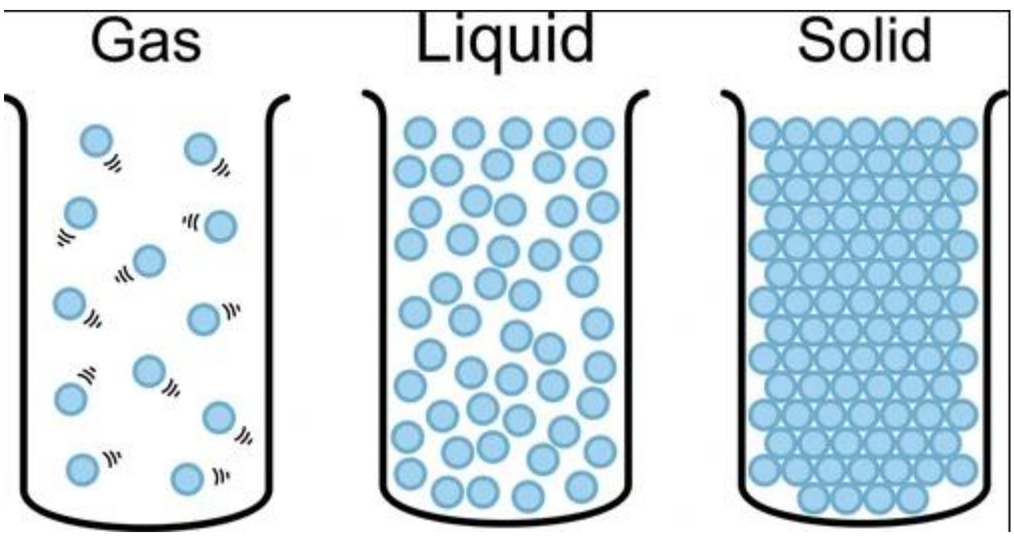
……………………………………………………………..

5-A piece of wood is put into a beaker of water its mass was 200 gm, if the mass become 270 gm and the volume of this piece is 100 cm3, Calculate the density if the wood?

……………………………………………………………..

-Compare between the 3 states of matter:

	Solids	Liquids	Gases
1. Motion of the molecules			
2. Intermolecular spaces			
3. Intermolecular force			
4. Shape			
5. Volume			
6. Example			



Good luck & Have fun ☺

Unit 1 – Lesson 1 – Part 1

Matter and its characteristics

Complete

1- Matter is anything that has ……mass………and…………volume……………..
2- You can distinguish between gold and silver by their different………color…………….
3- You can differentiate between table salt and sugar by their different………taste…………
4-The mass of one cubic centimeter of matter is known as …………density…………..
5-…………iron….and…copper………………sink in water as they have density……bigger……than water

Choose the correct answer

1- The smell property is a distinguishing factor between
   a) Iron and copper
   b) Wood and plastic
   c) Vinegar and perfume
   d) Silver and iron
2- The density of substance is ……………………property
   a) Chemical
   b) Physical
   c) Biological
   d) a and b
3- Equal masses of different substances have ………….volume
   a) Similar
   b) Different
   c) Constant
   d) equal

4-………………. is from the substances that float on water surface
a) Iron
b) Cork
c) Copper

Unit 1 – Lesson 1 – Part 2

Matter and its characteristics

A-Complete:

1- An alloy of …gold and copper Is used in making jewels while an alloy of Nickel and Chrome is used in making heaters coils .

2-Some solutions are good conductor of electricity such as …acidic…, alkaline……and …………salt solutions

while some solutions which do not conduct electricity like sugary solutions

3- Bridges are made up of iron and coated in the purposes of protecting them From rusting

4- Electric wires are made up of ……copper……….or ……aluminum……….

B -Give reasons for:

1- Cooking pots are made up of Aluminum where their hand grip are made up or wood or plastic

as aluminum is a heat conductor and has a high melting point ,while wood and plastic are heat insulators

2-Potassium and sodium are kept under kerosene surface

to prevent their reaction with atmospheric oxygen .

C-Write the scientific term:

2. The temperature at which a substance changes from solid state into liquid state. [……..melting point……]

3. The temperature at which a substance changes from a liquid state into gaseous state. […….boiling point………]

D-Classify the following substance according to the chemical activity:

Sodium- Gold - iron- potassium

Potassium

Sodium

Iron

gold

E- Compare between:

Molecules	Solid state	Liquid state	Gaseous state
Motion	Vibrate Limited	Slide past each other Free	Fast, randomly Completely Free
Intermolecular spaces:	Very narrow	Far	Very far
Intermolecular forces:	Strong	Weak	Very weak
Volume:	Definite	Definite	Indefinite
Shape:	Definite	Indefinite	Indefinite

Unit 1 – Lesson 2 – Part 1

Matter construction

What are the properties of molecules?

Properties of the molecules of matter:

1. Molecules keep the properties of matter
2. Molecules are in a state of continuous motion in all directions
3. There are spaces between the molecules of matter
4. There are forces between the molecules of matter

Write the scientific term:

1. The smallest part in matter that can exist freely having the properties of matter . [..........molecules..........]

A Type of matter keeps its shape & volume whatever the container's shape changed. [........solid.......]

Give reason for:

1- The volume of a mixture of water and alcohol is less than the sum of their volumes before mixing.
As the molecules of the alcohol fill the intermolecular spaces of the water

2- It is different to break down a piece of iron with your hand .
Because Iron has very strong intermolecular forces.

3- The color of water change on adding an amount of potassium permanganate to it .
Because the potassium permanganate molecules have a continuous motion in all direction

4- The Solid changes to liquid by heating.
Because the energy of molecules increases so they move faster, and the spaces increase then changes into liquid